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Electricity Research

SCOPE OF THE NEW COUNCIL

IN one respect the electrical industry is unique. Its ramifications extend to practically every other industry and it is the mainstay of many. For that reason, perhaps, in no other industry has the pressing need for concentration upon research been more definitely felt.

The lesson was learned during the first world war and it has been driven home by the second. The exchange of information which pooled experience for the common endeavour under the stress of war proved that many urgent problems can more quickly be dealt with on an adequate scale by co-operative effort. Thus growing recognition of the advantage that accrues from co-operation between professional and industrial elements gave shape to the E.R.A. thirty years ago.

Designer's Certainty

Those terrible "try and try again" days of haphazard seeking for fragmentary knowledge have gone for good. Today the designer knows exactly what to expect and is morally sure that, if he specifies it, he will get it. That certainty he owes very largely to co-operative research which, incidentally, helped in no small way during the inter-war years to strengthen this country industrially.

Tribute is due to the pioneer electricity supply members of the Association who, in those distant days, realized the necessity for research in our industry and were prepared to join with manufacturers in providing the necessary funds. None of them are likely, looking back on all that the E.R.A. has been able to accomplish, to regard their faith as having been misplaced. Without research the national grid, the backbone of the power system, could not have come into being; with its aid the manufacturer can more confidently offer his products in the world's markets.

Profitable Investment

The expenditure incurred in research has been a very profitable investment. How else could the financial support given by the supply section of the industry have grown to exceed that obtained from any other source? And now the individual supply organizations, which were a large proportion of the Association's members, have ceased to exist. In their place we have, in effect, a single body with the prospect of sharper focusing of the future image.

What that may be seems likely to depend upon the shaping of the Electricity Supply Research Council, set up by the B.E.A. last week. The question is not so much what may be required, as when. Research takes time, yet the results must be available in time for their utilization. Something more is now necessary than plain planning for probable needs twenty years hence.

It is noted that the E.S.R.C. is to be "purely" advisory and is evidently intended to be complementary, for important new ideas will continue to be conceived individually, but that alone is not enough. The idea must be developed to the stage at which it can be passed to the industry as a better device, or fresh

method, which can be shown to be an improvement on existing practice. All this requires co-operation, financial and technical; for it to be effective, one must know to what end one should co-operate so that first things shall come first. In this respect the composition of the new Council is noteworthy. Primary (fuel) power sources, thermodynamics and chemistry each have one representative; there are two of engineering and two of research, while the inclusion of a meteorological expert is an appreciation of the need to take account of climatic effects in this country.

INTERIOR LIGHTING

THE new edition of what is usually called the I.E.S. Code for lighting, natural and artificial, inside buildings of all kinds, shows that the schedule of recommended values of illumination for different kinds of activity has been amended in certain respects. The changes have been prompted by fresh knowledge gained from recent research. It will doubtless be noticed that the preferred values are in general lower than those thought to be proper in some other countries. The reason is that British illuminating engineers are not yet satisfied that any advantage is to be gained by raising levels above a particular limit.

RUSSIAN PRODUCTION

FIGURES purporting to show how the various branches of industry in Russia are meeting the requirements of the current Five Year Plan were recently published in the *Daily Worker*. It was stated that although the production of steam turbines in the second quarter of this year failed to reach the figures set for it, the electrical industry attained 107 per cent of its production "target." More interest would attach to statistics giving the actual volume of production; there is little value in these percentages when the basic figures are not disclosed.

CANADIAN TRADE

HOPE of increased trade with Canada was imparted in a recent address to members of the British Engineers' Association by Mr. L. D. Wilgress, Canadian High Commissioner in the United Kingdom. He spoke of the great opportunities in the Dominion, not only in large new projects but in many smaller current developments. In common with others who have commented on Canadian requirements Mr. Wilgress referred to prices (which he believed were competitive over a wide range of engineering products), to delivery and service (in which the United States has set up a high standard) and to the need for compliance with Canadian specifications. It is obvious that all this connotes intensive study of the Dominion market, at first hand if possible, but otherwise through the Government and other services which are available.

WINTER PROSPECT

No new ground was broken in the Commons debate on fuel and power last week. Criticism of electricity costs from Mr. Fraser was effectively answered by Mr. Palmer who quoted the *Electrical Review* in support of his contention that recent increases were due to "natural causes," and not to nationalization. Mr. Gaitskell nobly took all the responsibility for the imposition of the "Clow" surcharge and admitted his doubt as to its effectiveness as a reducer of the winter peak. He held that the plant position was not deteriorating although there was insufficient improvement to guarantee a "cureless" winter. Maybe we are now turning the corner, but restraint is still necessary if trouble is to be avoided.

IRISH RURAL ECONOMICS

To an increasing extent electrical development in Ireland and the prosperity of its main industry—agriculture—are interdependent. Realizing this the Government, under the Electricity Supply (Amendment) Act of 1945 made provision for a 50 per cent capital subsidy to enable the E.S.B. to undertake an ambitious rural electrification scheme. So far 37 areas have been completed and 11,415 consumers connected. In spite of efforts to reduce the cost, however, it has been necessary to negotiate a further subsidy to cover any deficiency during the first two years' working. Prevailing high prices are one reason for this; another is that electricity is still regarded as synonymous with lighting among the rural population, a misapprehension which the Board is doing its best to eradicate.

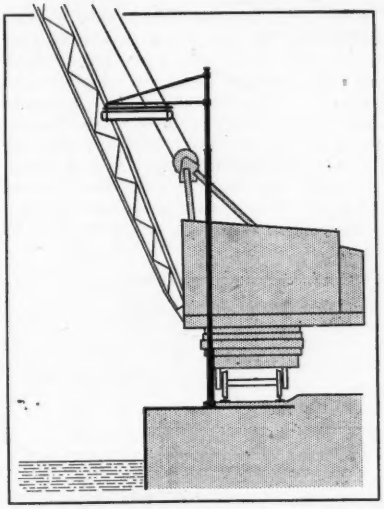
Unloading Coal by Fluorescent Light

First Outdoor Installation at a Power Station

By **G. V. HARRAP**, M.I.E.E.*

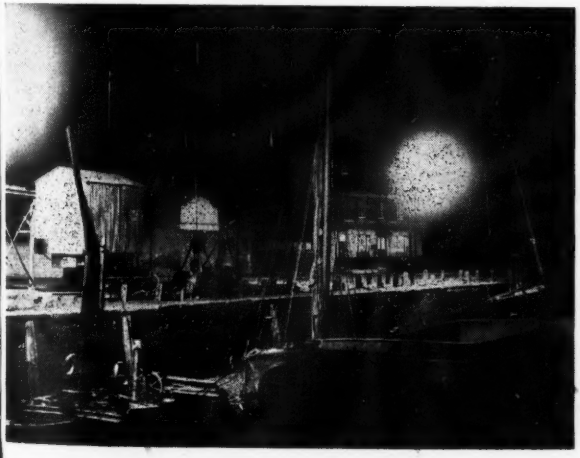
GRAVESEND scores three "firsts" in the use of outdoor fluorescent lighting. The installation was the first in Great Britain for handling coal, the first for illuminating a quayside and the first at any power station in the world, so far as can be ascertained from published data. The units described were commissioned in September, 1947, and operating experience has left no doubt about their value.

Coal is received at the Gravesend "selected" power station of the South Eastern Division, B.E.A., in barges which are moored to the quayside and it is lifted by cranes into hoppers. From these it is discharged into Lister trucks and transported either to stock or the boiler house elevator. In 1946 there was only one crane, over 40 years old, handling 20 tons an hour. The quayside lighting was by an incandescent lamp cluster on the crane jib, although unloading was only done in daylight. Because of high crane maintenance costs, it was decided to buy a new 40-ton luffing crane and discharging hopper.



Elevation of lamp standard alongside luffing jib crane

This decision was also influenced by the improved thermal efficiency of the station and the reduced cost of production. These factors meant a higher order of merit and longer running hours at higher load factors, hence higher coal consumption and greater use of the existing coal unloading facilities. This, in turn, meant

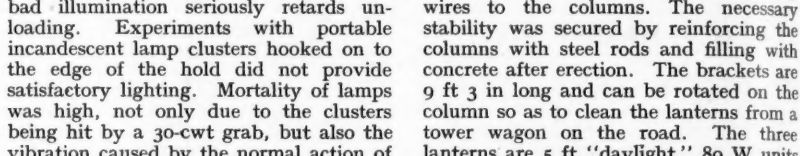


General standard of working illumination on coaling wharf.

* Gravesend District Manager, South Eastern Electricity Board.

working in the dark, particularly while there was only the one small crane. It was therefore important to provide adequate lighting, even before the new crane was installed.

Coal is not an easy commodity to illuminate and dry slack has poor reflecting properties. In a ship's or barge's hold bad illumination seriously retards unloading. Experiments with portable incandescent lamp clusters hooked on to the edge of the hold did not provide satisfactory lighting. Mortality of lamps was high, not only due to the clusters being hit by a 30-cwt grab, but also the vibration caused by the normal action of the grab hitting the steel barge. The 32 ft long, were therefore mounted 4 ft from the water's edge, with a long bracket for the lamp to light the barges. Because of the weight of the fluorescent lanterns, this meant a high bending moment on the column. A public road separates the quayside from the power station and it was not possible to fix stay wires to the columns. The necessary stability was secured by reinforcing the columns with steel rods and filling with concrete after erection. The brackets are 9 ft 3 in long and can be rotated on the column so as to clean the lanterns from a tower wagon on the road. The three lanterns are 5 ft "daylight" 80 W units in a housing having a "Perspex" outer



Lay-out plan of coal barges and cranes at quayside, (a) being the dressing stone edge, (b) existing post and chain fence and (c) the light tramway track.

trailing cable was also grabbed on occasion! Examinations were therefore made of sodium and mercury discharge installations for illuminating dead matt small coal. Neither seemed satisfactory, but fortunately the fluorescent street lighting installation at Bond Street was commissioned about that time. That development appeared to give the improved colour discrimination and illuminating strength for Gravesend's coal unloading installation, so units were ordered and, in collaboration with the makers, speedily installed.

The quayside adjoining the Gravesend power station was built in 1837. The owners forbade any disturbance of its face or of the dressing stones on its edge, because of concern about the condition of the brickwork. Hollow steel columns, cover. This has not been greatly affected by dust from nearly 100,000 tons of dry slack unloaded and the lantern metal has as yet not suffered from the industrial smoke and fumes from the power station, the adjoining gas works and nearby engineering and marine works. The lights are controlled from the gatehouse and no lamps have been replaced. No accurate record is available of the total burning time, but it is approximately 1,500 hours.

The layout of the barges and cranes at the quayside is such that the new crane is generally used. By arrangement with the South-Eastern Gas Board it unloads the gasworks coal as well as that for the power station. Normally the gasworks barges are handled in periods when no barges with station coal are

available and gas coal is taken away in tubs on a light tramway. Sometimes it is necessary to use both the 40-ton/hour 2 ton capacity and the 20-ton/hour 30 cwt capacity cranes and then the Lister trucks for the power station use the 3 ton hopper.

Two fluorescent lighting standards were installed 150ft apart at the outer limits of the crane jib operating areas. It was not possible to erect a lighting column between the cranes because the large crane may use the smaller hopper. The cranes can also travel on their track and there is not enough space to allow for the erection of a column clear of the new crane cab. Finally, some of the gasworks coal is delivered by Thames sailing barges whose masts would foul the lantern of the centre column, when the barges manœuvred into position. The barge ends occupy most of the central space and any loss of illumination is not a serious matter.

The illumination inside the barges with the 150ft spacing is exceedingly good. There are variations with the rise and fall of the tides, but the fitting of gates to the canal basin, now in hand, will overcome this difficulty by keeping a relatively steady water level. The colour of the coal is reasonably natural and the men have added confidence during work in the barges. There is no doubt that the use of fluorescent lighting has not only been worth while but, in my opinion, produces better results than other types of lamps.

It was at first thought that the cost of the installation would be extremely high. The actual expenditure was, in fact, reasonable and for the two units was as follows:—

Electrical equipment including lanterns, lamps, chokes, condensers £88
Steel columns and special brackets, labour and transport, etc. £52
Service cables, cut-outs, etc. £61

Maintenance costs have only borne one cleaning of the lanterns and electricity; running costs have totalled about £4.

The installation is small, but unique. It has been useful as a trial and further development will probably follow at other power stations. Coal is difficult to illuminate satisfactorily. In a situation such as that at Gravesend where the coal is black, the barges are painted black, the quayside brickwork is black with age and even the colour of the Thames water is hardly distinguishable from black, it is essential to have a standard of illumination which gives clear definition. This has been achieved in a way that is confidently recommended for similar applications.

Brazilian Water Power

A SURVEY of proposals for the development of Brazil's hydro-electric resources appeared in the *South American Journal* of 23rd July. Reference is made first to finance for the purpose including the $75 million loan made to the Brazilian Traction, Light & Power Co. by the International Bank for Reconstruction and Development; the credits of over $8 million granted to Brazilian subsidiaries of the American & Foreign Power Co.; and a suggestion of an international credit of $150 million, largely for the Sao Francisco Valley power project.

Brazil is said to take sixth place among countries with large potential hydro-electric resources with 19.5 million h.p.; of this only about 3 per cent is in use. As regards consumption of electricity, Brazil stands twentieth among the nations of the world. As supplies of coal and oil are inadequate the country is turning to water power for the purpose of obtaining cheap electricity for industry.

The most ambitious of the projects which have been put forward is the construction of a series of dams on the 1,800-mile long Sao Francisco River which, it is claimed, is capable of providing over half a million h.p. About 170 miles from the river mouth is the Paulo Afonso Cascade with a fall of 265ft; near the city of Itaparica is another fall, and there are said to be possible power sites near Joazerio and Pirapora higher up the river.

Another project involves the possible establishment of a light metals industry near Pocos de Caldas (Minas Geraes). The nearby Pardo and Anta Rivers are reported to have power possibilities which could be used in the development of zirconium and bauxite deposits.

Extensions to several existing power stations are contemplated, and there are proposals for the development of power from one or more rivers in the Rio Doce Valley for use in the exploitation of local nickel deposits.

Views on the News

By REFLECTOR

IT is reported from Burnley that local electricity consumers are loath to use a brand-new office which has been set up to receive their payments. Instead, they prefer to continue to pay their accounts at the electricity showrooms. I always thought it a cardinal principle of electricity supply authorities that the showroom was the best place for this purpose. By this means, consumers can see what is available in the way of apparatus, and can take the opportunity of seeking expert advice on their electrical problems from the showroom staff. Why, then, discourage people from doing this? There is, of course, a case for small offices in outlying districts in which the expense of a showroom is not justified.

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Twice in his speech in the fuel and power debate in the House of Commons last week Mr. Hugh Fraser spoke of reducing the load factor as though this were a desirable aim. Mr. A. M. F. Palmer put him right and Mr. Fraser explained that he meant reducing the amount that should be consumed. Even this, of course, is not the aim. Members of Parliament, as well as laymen outside the House, still do not grasp the significance of load, consumption and load-factor although the transport system provides them with a more easily understood parallel. Those who travel in London during the "rush hours" should appreciate the effects of overloading.

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Press reports are apt to convey an impression that the electricity authorities are vandals looking around the country for "amenities" to spoil. On the contrary, the British Electricity Authority and the Area Boards are most anxious to carry out their duties in as unobtrusive a manner as possible, although sometimes the cost of hiding lines and equipment is prohibitive. Reference was made in the last annual report of the Council for the preservation of Rural England to the establishment of contact with the B.E.A. and to arrangements which would ensure a continuance of the policy of co-operation which previously existed under the Electricity Commission and Central Electricity Board. Now the Council's Oxfordshire branch has expressed its appreciation of the continued and increasing support from the Southern Electricity Board, which has adopted a co-operative attitude towards the C.P.R.E. and the County Council when they have made suggestions for the deviation of new electricity lines.

* * *

Familiarity breeds other things than contempt. It sometimes leads to indifferent acceptance of what others consider to be well worth having and protecting. At the same time, there is force in the argument that the preservation of amenities, although most desirable, may adversely affect the well-being of many people. Laudable endeavours are being made to protect the beautiful scenery of some parts of Wales, but some of the inhabitants of North Cardiganshire think that these endeavours are misguided. It was suggested at a recent meeting of the County Planning Committee that, contrary to the contentions of opponents, the proposed Rheidol hydro-electric scheme would not destroy scenic beauty, and it would provide much-needed power for the benefit of the inhabitants of the area. It was claimed by a member of the Area Electricity Consultative Council that hydro-electric schemes in North Wales had actually improved the landscape.

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Two juxtaposed headings in the *Bucks Herald* of 22nd July raise a queer mental picture: "'Low-down' on Overhead Wires," and "Fat Child with Vase under Arm Removed." They covered a report of a meeting of the Buckinghamshire branch of the Council for the Preservation of Rural England, and related to two quite distinct items—notice of erection of overhead lines and an "ornament" in the Amersham Garden of Rest.

Industry and the House

Steel Bill Discussions

BY F. J. ERROLL,
M.A., A.M.I.E.E., M.P.

EVERY year since the war the last week in July immediately before the Summer Recess has been the most hectic few days of the Parliamentary year. Governments, just like people, tend to think that there is plenty of time left before they go on holiday, and then in the last few days there is a rush to complete outstanding business. In 1947 the American Loan crisis actually forced the Commons to sit during the first week in August, and this year it looked at one time as though the House would have to sit on Bank Holiday. As it is a sitting took place on Saturday last—a Saturday sitting is an extremely rare event.

After the debate on the economic situation, the Government was embroiled in the London dock dispute which became a subject for Parliamentary discussion every day until the men went back to work. Even so half-a-day's discussion of the dispute was squeezed in during the "marathon" debate on the Lords' amendments to the Iron and Steel Bill. Other debates during the final week covered the work of the Ministry of Fuel and Power, the ground-nuts scheme, the Report of the Press Commission and conditions in Africa. Parliamentary questions and adjournment debates continued as usual and if it was a hard time for M.P.s, it was even worse for Ministers.

All-night Sitting

While the Lords were discussing the Steel Bill they introduced a number of amendments, in spite of the Government's contention that they were unacceptable. Accordingly when the Bill came back to the Commons for consideration of these amendments a lively and prolonged debate ensued. M.P.s never like sitting up all night, but when important questions of principle are involved they are not prepared to let them go undiscussed just because the Government has allotted insufficient time for debate during usual Parliamentary hours. Normally a Bill which has so nearly completed all its stages does not attract much interest, but throughout the night of Monday, 25th July, a large number of Members joined in a series of stimulating debates on the amendments. Indeed the final debate of the sitting which took place between 9 a.m. and midday on Tuesday, after the House had been sitting continuously for nineteen hours, was a model of its kind.

Nationalization Date Impasse

The Lords wished to postpone the earliest date for the nationalization of the industry to July, 1950, i.e., after the latest possible date of the next General Election. The Minister of Supply, tired, but eloquent, refused to accept. He said that it was essential for nationalization to take place as soon as possible so that their great plans for the industry could go forward. The public had voted once in favour of this issue, and there was no cause why they should have to vote for it again. The arguments covered all aspects of the case, from Mr. Lyttelton's that the mandate was stale if it ever existed at all, to the fears of foreign apprehension ably expressed by Mr. Eccles. Mr. Jack Jones, the Joint Parliamentary Secretary and a former steel furnace man, wound up the debate before a lively House. He earned a well-deserved cheer for stating that whatever the verdict of the General Election he and his colleagues would gladly abide by the will of the people even if it should be against their party.

When the amended Bill was returned to the Lords they refused to accept the deletion of their postponement amendment. The Bill was accordingly rejected by the Upper House and can now only be forced through by the machinery of the proposed new Parliament Act which was itself once more presented to Parliament during this busy week.

A short debate on the Ministry of Fuel

and Power gave the Opposition a chance to criticise the winter surcharge. As Mr. McCorquodale pointed out, consumers' bills often went up from £5 to £12, and in other cases to £17. But for this surcharge there would probably have been no surplus of revenue for the B.E.A., but a deficit instead.

Mr. Gaitskell made a spirited defence of what he claimed was never anything more than an experiment. "I take full responsibility for accepting the recommendation of the Committee," he said. As it could not be definitely proved that the differential tariffs had notably lessened the peak demands he had decided not to continue with it.

On a quiet Friday morning the Commons passed the report and third reading of the Patents and Designs Bill. Of several suggestions made during the committee stage the Government could accept only one. In future the Comptroller will be able to insist on a greater employment of chartered patent agents. Unqualified practitioners are entering this complicated and specialized field, and are in many cases employed as whole-time staff by large companies. These individuals being unqualified themselves thereby prevent those who work under them from becoming qualified. At the same time their work may not be of quite the high quality which is required if the maximum value is to be obtained from the whole principle of patent law.

Fuel and Power Debate

OPENING a debate in the House of Commons last week on the country's fuel and power position, Mr. McCorquodale pressed for a statement on coal stocks and the winter prospects. He criticized the "Clow differentials," and said that the whole thing was not "put over" in a proper psychological manner. It was not until the bills came in during spring and summer that the reality of the situation was brought home to the users of electricity. He complained that charges had risen since electricity became nationalized. He hoped that having dropped the Clow differential scheme, the Minister would not return to it.

Mr. Hugh Fraser asked the Minister what plans he was making for refunds under the Clow differential. At the moment electricity charges were rising, but since the surcharges had been removed it was questionable whether the British Electricity Authority would be able to meet its own charges. How would it deal with the problem in the coming winter? How would it find the money it needed and how would it reduce the load factor over the whole area of Britain's electricity supply?

Mr. Palmer said that the Clow proposals were not a conspiracy on the part of the B.E.A. They were recommendations of an expert committee set up to find the best way of dealing with the very real problem of the electricity demand outrunning the capacity of the electrical system. The Minister could not be blamed too much: it was a highly technical matter and he acted on the recommendations of an expert committee. On the general question of charges, it was ridiculous to say that those who had advocated public ownership for electricity had ever suggested that there would be an absolute fall irrespective of the general level of prices. What they did say, and he believed this would be borne out, was that the experiment of the B.E.A. and the Area Boards would be similar to the successful experiment of the Central Electricity Board and that they would, by integration and by bringing into effect the practical proposals of the McGowan committee of 1935 on electricity distribution, be able to reduce costs.

"We all know," he continued, "that there has been a general increase in the price of electricity. I want to give a quotation from the *Electrical Review*, which is a paper that will be accepted on all sides. It is a commercial, technical and financial journal that has no connection with the party on this side or any side of the House. It is the leading paper of the electricity industry, and it claims to be the oldest—it was established in 1872. In the leading article on costs and prices on 14th May, 1948, which was within a few weeks of the vesting date, it stated: 'Those in the industry and most thinking people outside it, know that the necessity arises [that is, the need to increase prices] not from nationalization but from the steep rises in costs during the past two or three years which all the economy and efficiency of the undertakings could not counteract.' That was a statement of fact."

In conclusion, Mr. Palmer said there was another factor, namely, that there were municipal undertakings actually losing considerable sums in the two or three years before the vesting date. It was because the Coalition Government had dissuaded these

undertakings from making price increases as part of the general attempt to stabilize the cost of living. When at last in the electricity supply industry reality had to be faced it happened to coincide with the date of the taking over by the new authority, and to suggest that the increases were automatically the result of nationalization was absurd. The truth was that electricity today was one of the cheapest of all commodities and supplies as compared with 1938 prices.

With regard to the construction of new generating stations and the bringing into commission of new generating capacity, they had been led to believe that improvements were taking place, deliveries speeding up and bottlenecks widened. However, he was not so sure that the improvement was being maintained. If we had a severe winter, we might once again have load-shedding on a wide scale, which could be a great inconvenience to the domestic consumer and could, in some circumstances, be perfectly disastrous to industry.

Minister Accepts Responsibility

Mr. Gaitskell, the Minister of Fuel and Power, replying to the debate, said he took full responsibility for accepting the recommendations of the Clow Committee. He had thought it was desirable for an expert committee to examine what contribution might be obtained from the domestic consumer towards closing the potential gap between peak demand and available generating capacity. Most of the recommendations were technical in character and the Committee made it plain that they could not affect the position for a considerable period of time. Only one proposal might have affected the position in the following winter —the winter of 1948-49—and that was the proposal for a differential tariff. There was nothing very unusual about this. There were some undertakings which operated a differential between summer and winter charge for electricity before nationalization. The Ministry never supposed—and in his first announcement he made it perfectly plain—that here was a perfect answer to the peak load problem. There was one obvious deficiency about the proposal, apart from the hardship aspect. This was that while it might in the winter discourage, and in the summer encourage, the consumption of electricity, they could not be sure that the discouragement and the encouragement would take place solely during the peak hours. Admittedly, there was the risk that the differential tariff might influence consumption in the off-peak periods than in the peak periods and that it would therefore not contribute towards relieving the burden in the winter. Nevertheless, they decided that they ought to try out the proposal. He thought that any Minister in his position receiving the report of an expert committee, containing four people from the industry, which made a recommendation of that kind, would have been liable to serious criticism if he had completely turned it down.

He must make it plain that that differential tariff did not consist simply of a winter surcharge. There was a surcharge during three months plus a rebate during the remaining nine months of the year. It was not imposed for the purpose of raising revenue over the year as a whole, but simply to deal with the peak load problem. He was well aware how unpopular it was, but he would not necessarily have decided to drop the scheme because it was unpopular, for sometimes one must take unpopular actions. It might well have been that, though unpopular, it was the only way in which to prevent load shedding during the peak hours. If that had been the case, he thought that we would have had to continue the scheme next winter as well. When considering this matter, however, he was bound to say that he could not satisfy himself that the differential tariff had made a notable contribution towards reducing the peak demand. It might have done, but the figures did not show it. He did not apologize for this at all. Throughout, they said that it was an experiment. But in view of this, they decided not to continue with it.

Repayment Impracticable

With regard to the repayment of the surcharge by the British Electricity Authority, the Authority never suggested that every individual would get back the amount of the surcharge. The purpose was to penalize those who used excessive quantities of electricity during the three winter months and to benefit those who economized during that time and, of course, *vice versa* so far as the remaining nine months of the year were concerned. Therefore, it would have been quite wrong, and, indeed, the opposite of what was intended, if they were now to turn round—even if that were practicable, which it was not—and hand back the surcharge to those who were grossly excessive in their consumption of electricity while at the same time taking away the rebates from those who had economized through the winter because that would have to be done as well.

Mr. Bracken said that millions of very poor people now lived in all-electric homes, and this was a mean step of the worst possible kind, and, he thought, the Minister ought to repay the money taken by the Treasury from these poor people.

Mr. Gaitskell said it could not possibly be proved that living in an all-electric house necessarily meant that the individual lost over the year as a whole. The person who lost was the one who used electricity for space heating during the winter but did not use very much electricity in the summer, and it was precisely that type of consumer with whom they were anxious to deal.

Replying to Mr. Palmer's remarks about generating stations, Mr. Gaitskell said there was no reason for him to change what he said in the debate six or seven weeks ago. He said then that he thought that this year sufficient new plant would be added to take care of the increase in demand—somewhere in the neighbourhood of 800 MW. He still thought that was quite likely. It was true that there was some lag in the first quarter but it was regained to a large extent in the second quarter. They were watching the position very carefully, but he must emphasize that it would be some years before they could catch up with all the arrears. It was therefore quite true that if there was a cold winter there would undoubtedly be difficulties about electricity supplies, unless they could get by voluntary means, on which they would rely this winter, greater economies from the domestic consumer.

Coal stocks were above the programme level. He hoped output would improve, but it would not be right to create a great deal of anxiety at this stage about the position next winter.

PARLIAMENTARY NEWS

By Our Special Reporter

IN the House of Commons last week Mr. Langford-Holt asked the Postmaster-General whether he was satisfied that the 405 line television picture at present in use by the B.B.C. gave definition as clear as that given by the 525 line picture in use in the United States or the 819 line picture now being tried in France.

Mr. Paling said he did not think that in practice the American viewer got a picture noticeably clearer than that provided by the B.B.C. The French 819 line television system appeared still to be in the experimental stage. He understood it promised to give a clearer picture than the 405 line system, but he would expect at greater expense in money and wavelength space.

Squadron Leader Fleming asked the Postmaster-General whether he had approved the site at Holme Moss, chosen by the British Broadcasting Corporation for a television station to cover Manchester City and adjoining areas.

Mr. Paling said he had.

Replying to Dr. Broughton, Mr. Paling said he regretted he could not give a date at present when television broadcasts would begin in Yorkshire, but it was unlikely to be less than two years hence.

Long-Distance Telephones

In reply to Mr. Erroll, Mr. Paling said that there were 19,591 telephone circuits over 25 miles in length now in use. Of these, 1,963 were reserved for the exclusive use of the Service Departments, and 510 for other Government Departments.

London Electrification

Mr. Barnes, the Minister of Transport, told Mr. T. Macpherson that electric services between Liverpool Street and Shenfield would be started on 26th September and the change over from steam trains would be completed by 7th November.

Admiralty Engineers

Sir Jocelyn Lucas asked the Parliamentary Secretary to the Admiralty whether he was aware that negotiations about the salary scales of Admiralty electrical engineers had been going on for over two years; that as long ago as the middle of May Dr. Percy Dunsheath reported on the work of these engineers; and when he anticipated that some proposals on the salary scales arising from that report would be made.

Mr. W. J. Edwards said he expected that revised proposals would be made to the Association concerned very shortly.

Hearing Aids

Mr. Gerald Williams asked what percentage of "Medresco" hearing aids had been found to be faulty.

Mr. Blenkinsop said that about 3 per cent of the aids delivered to distribution centres were now returned as faulty. Of the aids issued to patients in the first year about 24 per cent had come in for servicing or repair in England and Wales, but it was difficult to know how much of this represented original faults in the instruments.

Birmingham Transport Conversion

PLANS have been approved by Birmingham City Council for replacing all tram and trolley-bus services by motor buses by the end of 1953. First trams to be replaced are those on the Moseley Road and Alcesta Lanes End route, scheduled for October.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Caroline Haslett Trust announces the award of further scholarships this year to **Miss Elizabeth Watt** (Fort William), **Miss Jill Parker** (Stockport and Buxton Cavendish Grammar School) and **Miss Margaret Wilkinson** (Pontefract and Cheltenham Ladies' College). They will each receive training at a recognized domestic science college preparatory to taking the E.A.W. certificate in electrical housecraft.

The General Electric Co., Ltd., announces that **Mr. A. J. Emery,** B.Sc., M.I.E.E., has been appointed manager of the North Western Area in its home organization as from 1st July in succession to **Mr. A. G. Hawkins,** who has retired. Mr. Emery was born at Daventry in 1901 and educated at Merchant Taylors' School and University College, London. He served a two years' college apprenticeship with Metropolitan-Vickers and was subsequently employed in the Motor Sales Department and at the Glasgow branch. He joined the G.E.C. in 1929 and has served continuously in India until his present appointment. After fifteen years at the Bombay branch, where he was manager from 1936 to 1944, he was appointed general manager and director in Calcutta in 1945 and in 1948 managing director of the G.E.C. Indian organization. From 1945 to 1949 he was responsible as senior director in India for the G.E.C. manufacturing and sales organizations in India, Burma and Pakistan. In 1946-47 he was a member of the Bengal Legislative Assembly and at the same time served on the Committee appointed by the Government of India to make recommendations for the establishment in India of heavy and light electrical manufacturing industries.

Mr. A. J. Emery

Mr. C. W. Myring, engineer of the Manchester branch of the General Electric Co., Ltd., is shortly leaving the country to take up an important appointment with the South African organization of the company. He is succeeded by **Mr. K. L. Clucas,** who has been with the G.E.C. for thirty-two years, and served his apprenticeship at the Witton Engineering Works. Except for a short break in 1926, when he was attached to the Witton Contract Department, Mr. Clucas has represented the company overseas as branch engineer in Burma, Malaya and Australia. He was in Malaya when that country was overrun by the Japs and was prisoner of war for over three years.

Mr. A. J. Skinner, branch manager of Siemens Electric Lamps & Supplies, Ltd., Bristol, recently retired after forty-six years' service with the Siemens' companies. His successor is **Mr. J. R. Yeates,** who joined the company in 1946 after twenty-four years' service with the Brighton electricity undertaking.

Col. C. J. Gill, area engineer of the inner division of the Newcastle-on-Tyne telephone manager's office for two years, has taken up his new appointment as telephone manager in the Sheffield area. Colonel Gill, who has been in the Post Office service for twenty-two years, was formerly area engineer at Middlesbrough.

Brook Motors, Ltd., have appointed **Mr. G. H. Brook,** A.M.I.Mech.E., A.M.I.E.E., A.M.I.P.E., to the position of deputy sales manager. Mr. Brook, who has been in charge of sales in the Huddersfield area for twelve years, is vice-president of the Huddersfield Engineering Society. For some years he gave lectures on costing, factory organization and machine tool motorization, and has made an extensive study of manufacturing methods on the Continent.

In our last issue we reported the appointments of **Mr. H. P. Martin** (general sales manager) and **Mr. W. D. Horsley** (chief electrical engineer) as directors of C. A. Parsons & Co., Ltd. The company has now sent us their photographs, which are reproduced herewith.

Mr. W. D. Horsley

Mr. H. P. Martin

Mr. A. R. Boothroyd, B.Sc.(Eng.), A.C.G.I., has been appointed to a Beit

Fellowship for Scientific Research. He will undertake research in electrical engineering at the Imperial College of Science and Technology under Professor Willis Jackson. Beit Fellowships have a value of £500 per annum.

In our last issue we reported the setting up of the constitution of the Electricity Supply Research Council by the British Electricity Authority. **Sir Harold Hartley,** K.C.V.O., C.B.E., F.R.S., who has been appointed chairman of the Council, is chairman of the British National Committee of the World Power Conference, and was one of the United Kingdom representatives at the United Nations Scientific Conference on the Conservation and Utilization of Resources, which was held last autumn at Lake Success, New York. Sir Harold is also a former chairman of the Fuel Research Board.

Sir Harold Hartley

Mr. D. Kemp, M.A., who has been in charge of the Intelligence and Statistics Division of the British Engineers' Association for the past twenty-five years, has retired, and at an informal ceremony last week he was presented by his colleagues with a barometer. After service in the 1914-18 war, Mr. Kemp commenced his connection with trade association work with the National Federation of Iron and Steel Manufacturers (now the British Iron & Steel Federation), joining the staff of the British Engineers' Association in 1924.

The **London Electrical Company (Blackfriars), Ltd.,** held its annual staff outing on 16th July. Over 100 members of the staff and friends went to Margate by coach.

As a result of the annual dinner-dance held in March and the annual golf competition held in May, the Mersey and North Wales Centre of the **Institution of Electrical Engineers** has donated £325 to the Institution's Benevolent Fund.

A cricket match was played on August Bank Holiday on the Western London Electricity Ground at New Eltham, between the Southern Sub-Area and the Western Sub-Area of the **London Electricity Board.** The Southern Sub-Area were the winners scoring 123 runs against the Western Sub-Area's 71. The match was a return fixture, the Southern Sub-Area being visitors on the previous occasion.

Obituary

Mrs. J. Nelson.—The death occurred on 23rd July of Mrs. Nelson, wife of Mr. J. Nelson, of British Insulated Callender's Cables, Ltd., Home Sales Department and late transmission engineer for the Central England District of the Central Electricity Board.

Mr. F. W. A. Mann.—The death occurred recently of Mr. Frederick William Arthur Mann, who joined the British Thomson-Houston Co., Ltd., in 1917 to take charge of the stationery department, which position he held until November, 1947, subsequently acting in an advisory capacity until his death.

Mr. W. E. Collins.—The death occurred on 29th July, in his seventy-fifth year, of Mr. W. E. Collins, founder and governing director of Albion Electric Stores, Leeds. Mr. Collins was a member of the Council of the Radio Wholesalers Federation, and was at different times secretary and chairman of the Lancashire and Yorkshire sections of the Electrical Wholesalers' Federation.

Wills

Mr. P. J. Plevin, M.I.E.E., consulting engineer, who died on 21st March last, left £9,376 gross (£9,292 net).

Mr. J. Spicer, managing director of Spicers (Electrical), Ltd., who died on 19th March last, left £5,615 gross (£4,991 net).

Mr. G. M. Mountford, senior sales engineer in the switchgear section of the Stafford works of the English Electric Co., Ltd., who died on 16th Dec. last, intestate. left £880.

Transatlantic Cable Memorial

ON 27th July a granite monument commemorating the landing of the first transatlantic cables, 1858-66, was unveiled at Bay Bull's Arm, Trinity Bay, Newfoundland, by the Lieutenant-Governor, the Hon. Albert J. Walsh.

The inscription explains that it was near this spot on 5th August, 1858, that the U.S.S. *Niagara* landed the first Atlantic telegraph cable when inaugural messages were exchanged by Queen Victoria and President James Buchanan. Shortly afterwards the cable failed, but on 27th July, 1866, an improved cable was laid between Valentia, Ireland, and Heart's Content, Newfoundland, by the S.S. *Great Eastern.* The monument was erected by the Western Union Telegraph Co., Cable and Wireless, Ltd., and the Commercial Cable Co., under the auspices of the Newfoundland Historical Society.

National Supply Survey

ELECTRICAL ASSESSMENT OF THE FOURTEEN AREAS

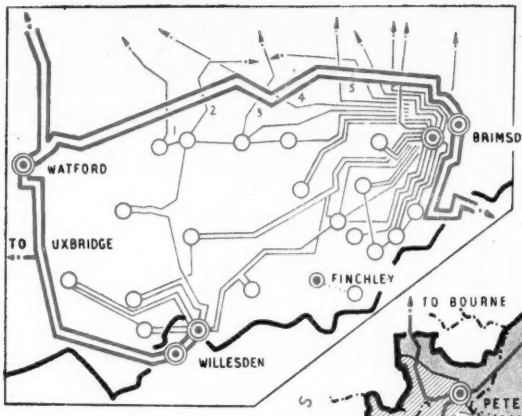
IN presenting to our readers this third article of our National Supply Survey, which deals with the Eastern Area, we emphasize that we are most anxious to keep alive throughout the whole series of articles the essential idea of an electrical assessment of each area, as distinct from descriptions of things in the area, such as organizations, power stations, transmission systems, consumers' installations, and other matters of this kind, which together contribute towards the assessment.

Because of this main purpose, we must in this article too, first answer the question: what sort of an area is the Eastern Area? With its 7,849 sq miles it is the largest of the fourteen areas into which England and Wales and South Scotland have been divided for nationalization purposes, and we should certainly characterize it as essentially a farming one. There are, however, striking contrasts within the area which can best be referred to in terms of population densities. In the extreme south of the area which incorporates some of the North London suburbs and where confusion on the map has demanded an inset, there is a population density of about 20,000 per sq mile, whereas the population density of the rural counties of Huntingdon and Norfolk is about 150 per sq mile. The population density for the whole area is 595 per sq mile.

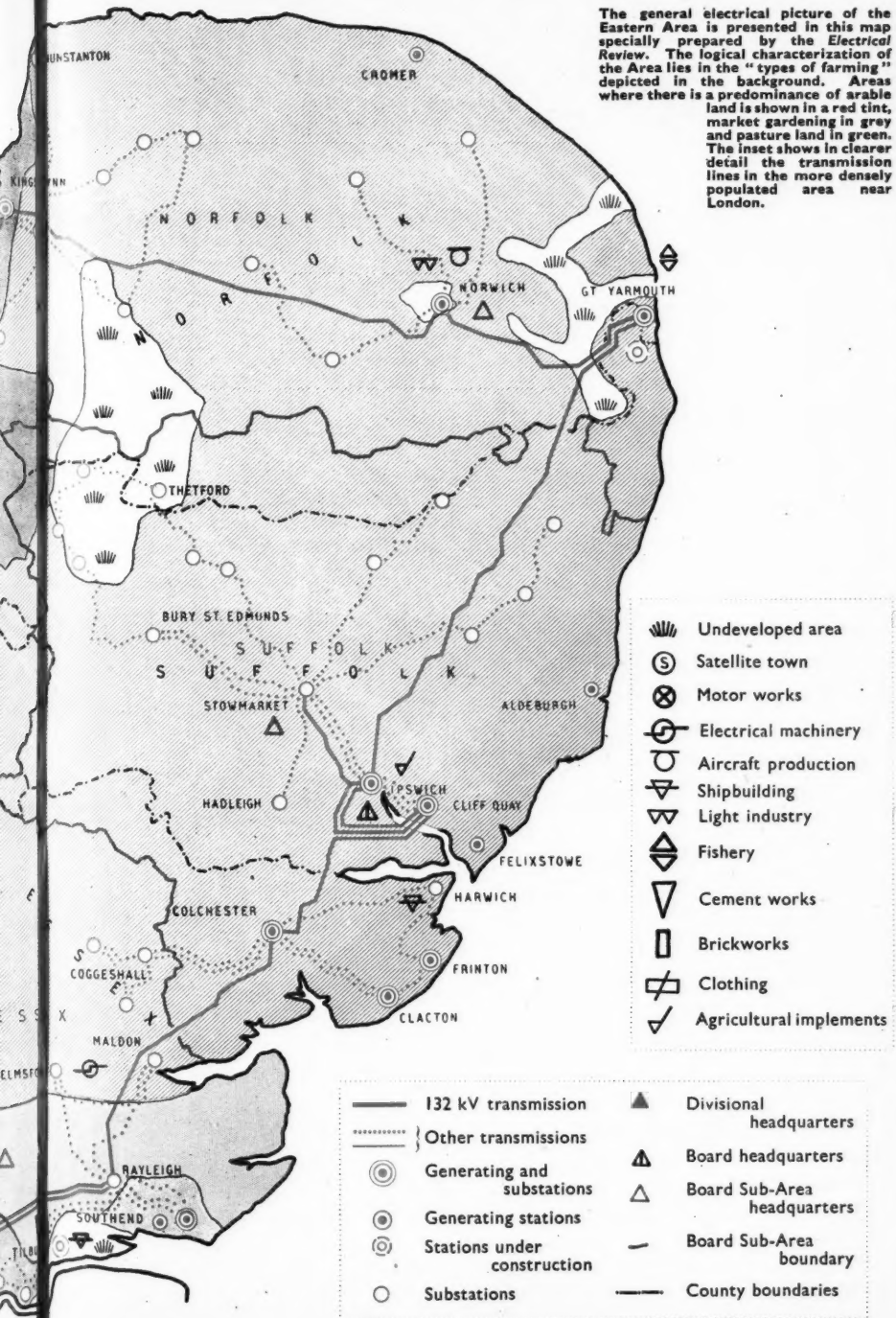
3. EASTERN AREA

The area boundary is the Thames from the east end of the London Area and the coast line of Essex, Suffolk and Norfolk to a point on the Wash coast which was the north-western point of the area of the former King's Lynn undertaking; in a general southerly direction from the west side it then follows part of the boundaries of the following former undertakings: Bedfordshire, Cambridgeshire and Huntingdonshire, Peterborough, B.C. & H. again, Bedford, Luton, Aylesbury, Chesham, Watford,

West Mill, seen above, is one of the Eastern Area villages which contribute to the amenities



TO BOURNE
PETERBOROUGH
TO CORBY
HUNTINGDON
TO NORTHAMPTON
LITTLE BARFORD
CAMBRIDGE
BEDFORD
GOLDINGTON
AUSTIN CANONS
SAFFRON WALDEN
LETCHWORTH
SUNDON
LUTON
AYLESBURY
RYE HOUSE
CHILTERNS
TO GLOUCESTER
TO OXFORD
BRIMSDOWN
WATFORD
FINCHLEY
TO BARKING
TO UXBRIDGE
TO WILLESDEN
EAST MIDLANDS
SOUTHERN
LONDON


The general electrical picture of the Eastern Area is presented in this map specially prepared by the *Electrical Review*. The logical characterization of the Area lies in the "types of farming" depicted in the background. Areas where there is a predominance of arable land is shown in a red tint, market gardening in grey and pasture land in green. The inset shows in clearer detail the transmission lines in the more densely populated area near London.
HUNSTANTON
CROMER
KING'S LYNN
NORFOLK
NORWICH
GT YARMOUTH
THETFORD
BURY ST. EDMUNDS
SUFFOLK
STOWMARKET
ALDEBURGH
IPSWICH
HADLEIGH
CLIFF QUAY
FELIXSTOWE
HARWICH
COLCHESTER
COGGESHALL
FRINTON
CLACTON
MALDON
RAYLEIGH
SOUTHEND
Undeveloped area
Satellite town
Motor works
Electrical machinery
Aircraft production
Shipbuilding
Light industry
Fishery
Cement works
Brickworks
Clothing
Agricultural implements
132 kV transmission
Other transmissions
Generating and substations
Generating stations
Stations under construction
Substations
Divisional headquarters
Board headquarters
Board Sub-Area headquarters
Board Sub-Area boundary
County boundaries

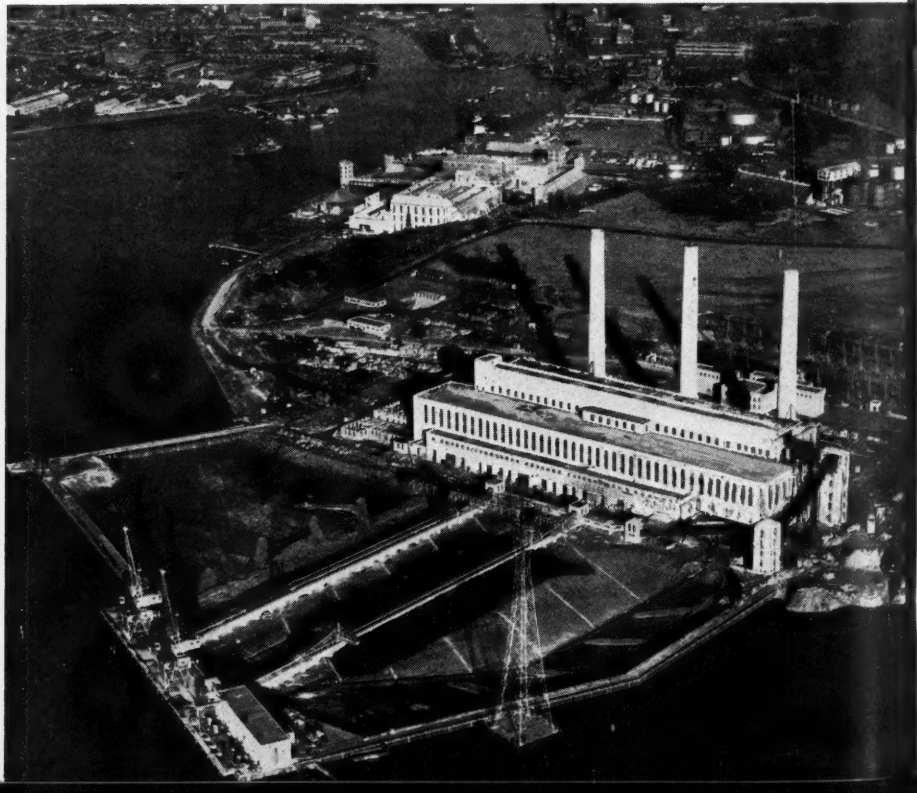
and Northmet back to the London Area boundary on the west.

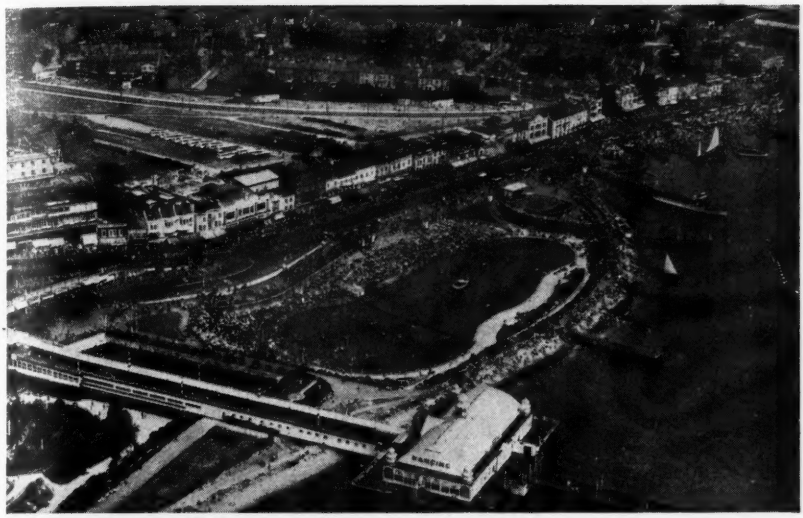
To continue the list of the former undertakings skirted from this point we have Finchley, Hornsey, County of London, Thurrock, County of London, Southend, County of London, Colchester, Frinton, Colchester, Clacton, Frinton, Colchester, Colne Valley, Harwich, Felixstowe, East Suffolk, Aldeburgh, East Anglian, Lowestoft, Great Yarmouth, Norwich and again East Anglian. The following "inland" former undertakings, from north to south, complete the list of undertakings taken over by the Eastern Electricity Board last year: East Dereham, Wisbech, Bungay, Newmarket, Cambridge, Ipswich, Letchworth, Hitchin, Welwyn Garden City, Brentwood, Wickford, and Northwood.

The area boundary thus outlined follows in the east, north and west, with minor exceptions, the boundaries of the former C.E.B., East Anglian and South-Eastern districts, i.e., the St. Paul's grid control area. The exceptions are a short length north-west of Peterborough and the last few miles west of the London Area in the south (see composite map of Divisional area and former C.E.B. district boundaries in the *Electrical Review*, 3rd June, 1949). Thus the national grid transmission system in the Eastern Area is controlled outside the area—in fact, London.

The bulk of the Eastern Area is shown on the population density map as "dense rural" (50 to 400 persons per sq mile), while, apart from isolated pockets, there is towards the north-west a sizeable irregular stretch of sparse rural land, i.e., below 50 per sq mile. The area is also characterized by many small market towns indicated by small patches of "suburban and industrialized rural land," i.e., 400 to 6,400 per sq mile. Included among these market towns are such names as Bishop's Stortford, Saffron Walden, Haverhill, Needham, Stowmarket, Diss, Bungay and Coltishall. A few cities and towns, including Cambridge, Peterborough, Norwich, Great

The new Cliff Quay generating station already has 80 MW of plant in commission (*Aerofilm photo*)





Southend attracts holidaymakers in their thousands (*Aerofilm photo*)

Yarmouth, Ipswich, Colchester, Chelmsford and Southend come within the "urban" range—6,400 to 25,000 per sq mile—while the only "dense urban" spots (above 25,000) are the centres of Southend, Great Yarmouth and Norwich.

The land utilization map shows the bulk of the area to be arable land, with some forest and woodland corresponding with the sparse rural area in the north west mentioned earlier, and a belt of meadow land in the south roughly bordering the London Area. Following this we get the logical characterization of the area on the "types of farming" map which shows most of the area in the east and south as arable farming land, with a good slice of market gardening area in the north-west and a belt of dairy farms in the south corresponding to the meadowland already referred to.

The Royal Estate at Sandringham and Cambridge University are places of interest in the area, as are the cathedral city of Ely, the herring fishing port of Great Yarmouth, the Continental shipping port of Harwich, and Southend and Whipsnade Zoo which draw holiday makers and visitors in their thousands.

What has the survey revealed electrically? The Eastern Electricity Board acquired 38 undertakings—20 municipal and 18 company—which were named in our general definition of the area. These undertakings had a great variety of tariffs available to consumers. There were 66 two-part tariffs and a corresponding number of flat-rate tariffs for domestic consumers, while on the commercial side there were 58 two-part and a corresponding number of small-power and other flat-rate tariffs. The number of tariffs was out of proportion to the number of undertakings because of the existence of "tariff boundaries" within some of the undertakings' areas. There was an appreciable difference between the upper and lower limits of the charges in respect of both two-part tariffs and flat rates.

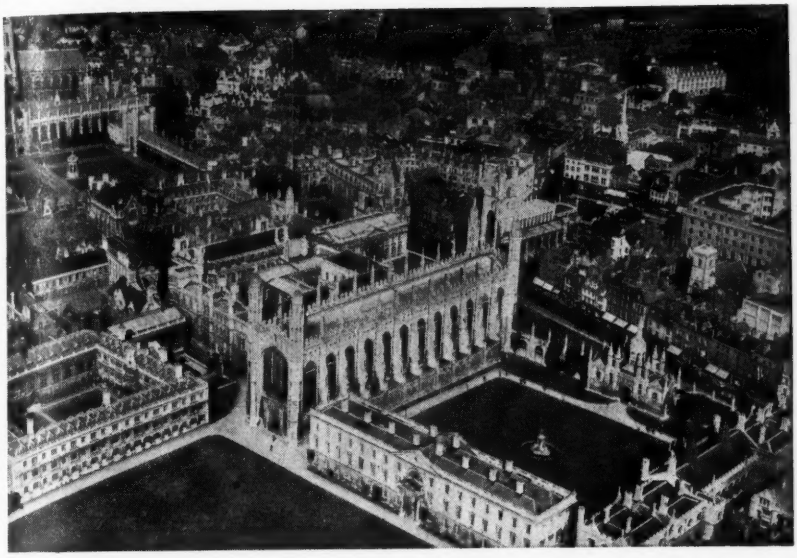
Because the former Northmet, East Anglian and Norwich undertakings covered about half the Eastern Board's consumers the following tariffs may be regarded as typical for the whole area. Northmet: a domestic two-part tariff with a standing charge based on floor area plus 0.5625d per kWh, and a lighting flat tariff of 6.75d per kWh; East Anglian: a domestic two-part tariff with a floor-area charge of 12s per quarter up to 700 sq ft with an additional 1s 6d for each 100 sq ft up to 1,600 sq ft and

a further addition of 1s 3d per quarter for each further 100 sq ft, plus a unit charge of 1d, and a lighting flat tariff of 7d per kWh. Norwich: a domestic two-part tariff with a fixed charge of between 12.7 per cent and 28.1 per cent of the rateable value, plus a kWh charge of between 0.704d and 1.125d, depending on the locality—urban or rural—and lighting flat rates of between 5.62d and 9d per kWh. A few small undertakings had tariff levels materially higher than those quoted, but they served only a small number of consumers.

The personal contact afforded by the local service centre is important under all conditions, but it has a special significance to-day when many consumers are remote from authority headquarters, so that the situations of service centres are very important to such a survey. For convenience, the following have been arranged in sub-area groups: Chilterns: Aylesbury, Bedford, Chesham, Dunstable, Hemel Hempstead, Leighton Buzzard, Luton, Northwood, Pinner, Rickmansworth, Ruislip Manor, Watford, and a mobile demonstration outfit. Essex: Braintree, Brentwood, Chelmsford, Dunmow, Grays, Halstead, Leigh, Little Thurrock, Maldon, Romford, Saffron Walden, Shoeburyness, Southend, Tilbury, Upminster, Westcliff, Wickford and Witham. Fens: Cambridge, Chatteris, Ely, Huntingdon, March, Newmarket, Peterborough, Ramsey, St. Ives, Sawston, St. Neots, Soham and Wisbech. Norfolk: Bungay, Cromer, Downham Market, Fakenham, Great Yarmouth, Holt, Hunstanton, Lowestoft, Martham, Norwich (three), Reedham, Sheringham, Swaffham, Wroxham, Wymondham and King's Lynn. Northmet: Barnet, Biggleswade, Bishop's Stortford, Boreham Wood, Buntingford, South Chingford, Chingford, East Barnet, Edgware, Edmonton, Enfield, North Finchley, Finchley, Friern Barnet, Golders Green, Harpenden, Harringay, Harrow, Harrow Weald. South Harrow, Hatfield, Hendon, Hertford, Hitchin, Hoddesdon, Hornsey, Kenton, Kingsbury, Letchworth, Mill Hill, Muswell Hill, Palmers Green, Potters Bar (two), Royston, St. Albans, Southgate, Stevenage, Tottenham, Waltham Cross, Ware, Welwyn, Wembley, Whetstone, Winchmore Hill, Wood Green and two travelling show-

GENERATING STATIONS OPERATED BY THE EASTERN DIVISION

Station	Previous Owner	Type of station	Installed Capacity MW	Effective Capacity sent out MW	Limitations	Type of operation
Aldeburgh	Aldeburgh E.S. Co.	Diesel	0.20	0.18	Gas-oil engines	Peak-load
Bedford	Corpn.	Steam	20.0	19.0	Boilers	2-shift
Brimsdown "A" ...	Northmet Co....	Steam	43.0	40.0	Boilers	Base-load
Brimsdown "B" ...	Northmet Co....	Steam	159.0	148.0	Boilers	Base-load
Cambridge ...	Cambridge E.S. Co.	Steam	7.25	7.0	Turbines	2-shift
Clacton	U.D.C....	Diesel	2.45	1.8	Diesel engines	Peak-load
Colchester	Corpn.	Steam	7.5	6.0	Cooling	2-shift
Cromer	East Anglian E.S. Co. ...	Diesel	0.57	0.57	Diesel engines	Peak-load
Felixstowe ...	U.D.C....	Diesel	0.3	0.3	Diesel engines	Peak-load
Finchley	Corpn.	Steam	4.7	3.3	Cooling	Peak-load
Frinton	Frinton-on-Sea E.L. & P.Co.	Diesel	0 62	0.62	Diesel engines	Peak-load
Gt. Yarmouth ...	Corpn.	Steam	15.25	15.0	Turbines	2-shift
Ipswich	Corpn.	Steam	17.25	17.0	Turbines	2-shift
King's Lynn ...	Corpn.	Steam	5.0	5.0	Turbines	2-shift
Letchworth ...	First Garden City, Ltd. ...	Steam	27.5	25.0	Boilers and turbines	Base-load
Little Barford ...	Beds, Cambs & Hunts Elec. Co.	Steam	120.0	112.0	Turbines	3-shift
Luton	Corpn.	Steam	24.5	23.0	Turbines	2-shift
Norwich	Corpn.	Steam	72.5	70.0	Turbines	3-shift
Peterboro'	Corpn.	Steam	18.5	18.0	Turbines	2-shift
Southend (London Road and Leigh combined) ...	Corpn.	Diesel	5.75	5.0	Diesel engines	2-shift
Watford	Corpn.	Steam	37.75	27.0	Boilers	3-shift



Cambridge University is one of the principal places of interest in the area (*Aerofilm photo*)

rooms. Suffolk: Beccles, Brightlingsea, Bury St. Edmunds, Clacton, Colchester, Diss, Dovercourt, Felixstowe, Framlingham, Frinton, Hadleigh, Halesworth, Harleston, Haverhill, Ipswich, Leiston, Manningtree, Mildenhall, St. Osyth, Southwold, Sudbury, Stowmarket, Thetford, Tiptree, Walton-on-Naze, West Mersea and Woodbridge.

Then there is the Eastern Division of the British Electricity Authority, together with twenty-two generating stations which it took over last year, having a total installed capacity of 589.59 MW and an effective sent-out capacity of 543.77 MW. With a plant capacity of 159 MW, Brimsdown "B" is the largest station operating in the Division, while Little Barford is a good second with a capacity of 120 MW. Most of the others are small stations, Aldeburgh with a plant capacity of 200 kW being the smallest. A study of the specially prepared schedule of the existing stations will impart the essential broad picture that we aim to give, i.e., the position when all in the area is welded into one organization. Actually, it represents the position at 12th March, 1949. The limitations which have settled the effective capacity figures do not, of course, include such temporary matters as plant breakdowns.

Extensions are being carried out or are projected at Brimsdown "B" (60 MW) and Peterborough (80 MW). Further, five new stations are under construction in the area, including one near Tilbury in the south-east corner which, we believe, with its ultimate capacity of 720 MW, will be the largest generating station in this country. The other stations under construction are: Great Yarmouth, 360 MW; Cliff Quay (Ipswich), 270 MW, of which 80 MW is already in commission; Rye House, 192 MW; and Bedford, 180 MW.

At this stage in such a survey one may well ask how is electricity used? For the period 1st April, 1948, to 31st March, 1949, the totals of kWh generated, consumed in and imported into the area, were 1,651 million, 3,708 million and 2,057 million, respectively, while the simultaneous maximum demand was 1,200 MW.

Eastern Board executive team. Left to right: Messrs. H. Brierley, G. N. Green, J. E. Blair, C. T. Melling, A. Bond, H. C. Walters and E. A. Fowler

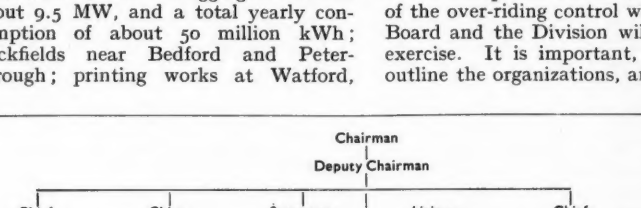
On 31st March, 1948, the total number of consumers connected was 1,182,844, to whom 3,065 million kWh was sold during the year ended on that date. This figure should not be confused with a corresponding one just given and coupled with generation details for a later period. The distribution of the energy sold is shown by the following load analysis: Domestic 44.5 per cent, industrial 36 per cent, commercial (shops, etc.) 12.2 per cent, traction 5.5 per cent, farms 1.3 per cent, and public lighting 0.5 per cent.

A "breakdown" of the overall information already given is shown geographically in terms of sub-areas in the table opposite.

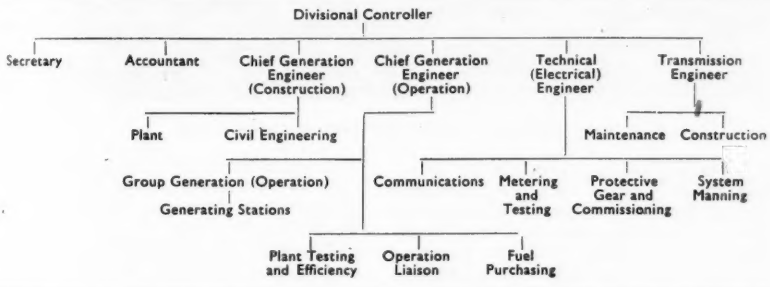
Among the largest consumers are Vauxhall Motors, Luton, with a m.d. of about 14 MW and an annual consumption of about 38 million kWh; Associated Portland Cement Manufacturers in Essex and Bedfordshire, with an aggregate m.d. of about 9.5 MW, and a total yearly consumption of about 50 million kWh; brickfields near Bedford and Peterborough; printing works at Watford, Aylesbury and Dunstable; and boot and shoe factories at Norwich.

It is outside the purpose of these National Supply Surveys to describe the actual organizations set up under nationalization to deal with the public electricity supply in each area, or their work, except to stress the importance of the over-riding control which the Area Board and the Division will increasingly exercise. It is important, therefore, to outline the organizations, and to this end

Sub-Areas	Area sq. miles	Population (thousands)	Population per sq. mile	Million kWh sold year ended 31.3.48	Million kWh sold per sq. mile
Chilterns	820	700	854	621	758
Northmet	687	1,500	2,183	1,166	1,697
Essex ...	1,132	1,000	883	571	505
Fens ...	1,320	370	280	215	163
Norfolk ...	1,906	550	289	252	132
Suffolk ...	1,984	550	277	240	121
Total Eastern Area ...	7,849	4,670	4,766	3,066	3,276



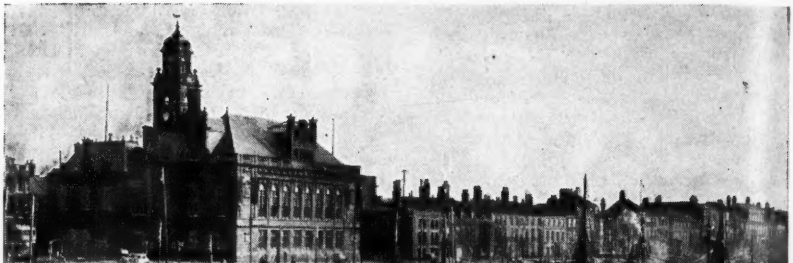
we rely mainly on the organization "trees" and the special map. With their headquarters at Wherstead, a few miles south of Ipswich, in delightful Suffolk countryside, Mr. C. T. Melling, chairman, Eastern Electricity Board, and his deputy, Mr. H. C. Waters, control the distribution and sale of electricity throughout the area, with the help of the following principal officers: Mr. G. N. Green, chief engineer; Mr. J. E. Blair, chief accountant; Mr. A. Bond, secretary; Mr. H. Brierley, liaison officer; and Mr. E. A. Fowler, chief commercial officer.



The Eastern Division of the British Electricity Authority, which controls the generation and main transmission throughout the area, has as its headquarters Northmet House, Southgate, N.14, where the Divisional Controller, Mr. W. N. C. Clinch, previously controlled the activities of the Northmet Power Co. His principal officers are: Mr. A. C. Thirtle, chief generation engineer (operation); Mr. T. Yule, chief generation engineer (construction); Mr. W. Casson technical (electrical) engineer; Mr. A. W. Sweetinburg, transmission engineer; Mr. A. H. Stafford, secretary; and Mr. H. G. Penniket, accountant. The Eastern Division Area is not a control area with respect to the national grid, hence the missing post of system operation engineer.

And what of the future? The low figure of sales to farms of 1.3 per cent of the total points to the need for intensive load building, in the first place in connection with agricultural premises where supplies are already available, but are not used to full advantage. Then the area is to have at least five new satellite towns which will result in considerable demands for electricity by virtue of an increase in the total population of the five towns from the present figure of 62,800 to the planned population of 241,500. Four of the satellite towns—Harlow, Hatfield, Stevenage and Welwyn—are all in the Northmet Sub-Area, and they have present and planned populations of 4,300 and 60,000; 12,000 and 25,000; 6,500 and 60,000; and 18,000 and 36,500, respectively. The fifth new town, Hemel Hempstead, is in the Chilterns Sub-Area, and its present and planned populations

Eastern Division executive team. Left to right: Messrs. A. H. Stafford, H. G. Penniket, A. C. Thirtle, W. N. C. Clinch, T. Yule, W. Casson and A. W. Sweetinburg



The "Scotch" herring fishing port of Great Yarmouth

are 22,000 and 60,000 respectively. Finally, it is reasonable to anticipate some industrial load increase throughout the area in view of the tendency to disperse industry throughout the country.

We are indebted to Mr. C. T. Melling, Mr. W. N. C. Clinch, and their principal officers, for co-operation in the investigation which enabled us to prepare this survey.

Referring to the specially prepared map accompanying this article we draw attention to two minor errors which escaped notice until after the map had been reproduced.

The symbol for chemical industries in the south west corner of the area is not indicated in the key, and the words "undeveloped area" in the key have not the usual significance associated with this term; they merely imply barren areas industrially or agriculturally.

Timing Glass Yarn Spinning

SELF-RESETTING Londex synchronous process timers "Type ASR" installed at the factory of Fibreglass, Ltd., Possilpark, Glasgow, are used in the continuous filament spinning department to enable the correct weight of the standard package to be produced in the primary furnace spinning operation. In this process, Fibreglass yarn is drawn from electrically heated furnaces and wound on to a paper tube carried on a mandrel rotated at a high constant speed.

At the commencement of each new run, the yarn is attached to the mandrel, which is then brought up quickly to its running speed. At the same movement, the operator closes a switch which starts the timer, which is permanently preset for the length of run required. Half a minute before the run is reached a yellow lamp is lit warning the operator to stand by to stop the machine and break the yarn immediately the final red lamp lights and the yellow lamp is extinguished. The red lamp remains on until the operator has stopped the machine and finally opened the signal switch which allows the timer to reset itself ready for the next run.

The timers are operated continuously through a 24-hour day, six days a week, a cycle being completed approximately every seven minutes. When first installed, one timer was mounted adjacent to each spinning unit, but in the new Possilpark factory, just completed, all the timers have been mounted together on the main switchboard, remote from the spinning operators, and are free from vibration and interference.

NEW BOOKS

Elements of Electromagnetic Waves. By L. A. Ware. Pp. 203; figs, and index. Sir Isaac Pitman & Sons, Ltd., Parker Street, Kingsway, London, W.C.2. Price 20s in U.K.

This American book has been written as an introduction to the subject for undergraduate engineers. It assumes only a knowledge of basic a.c. theory and elementary calculus. The book starts by developing the necessary vector algebra in two chapters, after which the fundamental equations of electric and magnetic fields are studied, leading up to what the author chooses to call Maxwell's "Laws." The subject of plane waves is then discussed. A chapter on curvilinear co-ordinates follows and the reflection of plane waves leads to a discussion on guided waves and the rectangular wave guide, which is not intended to be more than introductory. The book ends with a chapter on radiation.

The style is clear, as would be expected by readers of Professor Ware's earlier book on networks, and the text is illustrated by good diagrams and plenty of examples. Any student who works through the examples should gain an excellent knowledge of the more elementary phenomena of the electromagnetic field The book does, however, seem a little too much divorced from practical problems. Surely engineers want to know more about the way in which electromagnetic waves are used than they are told here? It is, nevertheless, a good introduction to the subject, especially if used in conjunction with another book giving a more physical and qualitative approach.—A. H. B.

Pulses and Transients in Communication Circuits. By Colin Cherry, M.Sc. (Eng.), A.M.I.E.E. Pp. 317; figs. 129; index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 32s.

The past ten years have seen a rapid growth of pulse technique in radar and television and the ease with which it lends itself to oscillographic display has led to attempts to analyse networks. This is the reverse of the usual mathematical approach but one which for the experienced worker can often yield quick results.

This book will be of value to radar and television engineers in particular, not only in tackling conventional problems of conveying a pulse from A to B without detriment to its shape, but also in the analysis of circuits. Both filter networks and multistage amplifiers are treated, and the author shows his broad experience in the rationalizing methods he employs. His use of the idealized case is of the utmost value not only in obtaining rapid solutions but also for assessing the true performance of networks by comparison with actual measurements and it serves to keep the potential results clearly in mind.

After an introductory chapter on fundamentals the transient is analysed into its components which are presented as a spectrum showing their relative importance. The response of networks under steady-state and transient conditions is also studied. The chapter on multi-stage amplifiers is followed by a useful account of asymmetrical sideband working, and the book concludes appropriately enough with a chapter on reflections and echo effects.

Mr. Cherry refers throughout to an encyclopædic body of literature, and the layout of the text and diagrams is clear. He can claim to have presented some new ideas as well as to have achieved his primary object of putting contemporary ideas in thoroughly shipshape order.—F. G. G. A. M.

Electronic Time Measurements. Edited by B. Chance, R. I. Hulsiger, E. F. MacNichol and F. C. Williams. Pp. 538+xviii; figs. and index. McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C.2. Price 42s in U.K.

This book, which is Volume 20 in the M.I.T. Radiation Laboratory Series, describes and compares systems for the accurate measurement of short recurring intervals of time. Such intervals, defined by pulses or a phase displacement, commonly correspond to the range from a radar transmitter of a reflector or target whose movement may have to be tracked manually or automatically in time in such a manner that data concerning its speed can be derived.

The emphasis of the book is on systems directed towards the solution of military and navigational problems and the circuits used are often taken from earlier volumes in the series, being treated as elements of the system. Thus, although circuit diagrams are associated with a brief functional description, detailed design data are presented only occasionally as in the excellent sections on automatic time measurement.

The radar system designer will doubtless derive benefit from this volume, not least because overall performance figures for complete systems are often indicated and the causes of error or inaccuracy discussed. The general reader and circuit designer will find the book useful mainly for occasional reference. The systems described, however, are so particularized that their trans-

fer and application to new fields is not likely to be an easy matter, especially as the essential design details are assumed to have been provided in other volumes of the series.

Unfamiliar nomenclature is covered by a short glossary, and while there will be some who will approve the new terms, others, including the reviewer, will be disturbed to find (for example) that "free running" is a mere colloquialism for "astable."—J. MacG. S.

Sound Film Projection. Edited by E. Molloy. Pp. 260; figs. and index; (third edition) George Newnes, Ltd., Tower House, Southampton Street, London, W.C.2. Price 21s.

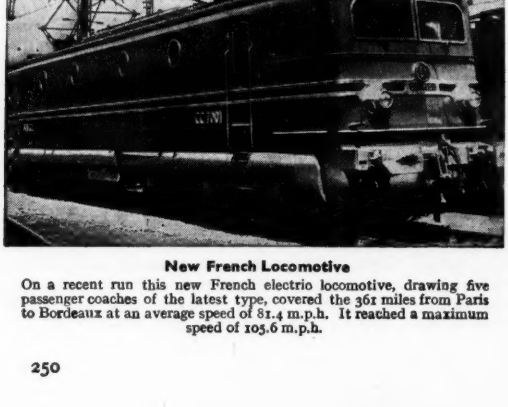
This book brings together in a convenient form the information necessary for an understanding of modern sound-film projection equipment and technique. Of particular interest to the technician are the sections on the sound-film systems of British Acoustic Films, Ltd., British Thomson-Houston Co., Ltd., R.C.A., Photofilms, Ltd. and the Western Electric Co., Ltd., each system being dealt with in detail. There is also a section on one of the latest Western Electric developments, the "Westrix" sound system. The section on maintenance, fault tracing, repairs and servicing are well written and should be of great practical value to the cinema operator, installation and service engineer.

This work is recommended to all whose interests are closely associated with sound-film projection, sound reinforcement equipment and public address systems. With its clear expositions of the principles of construction of the various types of equipment, its detailed information on operation and maintenance, and its profusion of illustrations and schematics, the book is an invaluable source of reference for cinema, theatre and sound technicians.—J. H. H.

Technology of Plastics. By B. L. Davies, M.Sc., A.R.I.C., F.I.R.I. Pp. 421; figs. 106; index. Sir Isaac Pitman & Sons, Ltd., Parker Street, Kingsway, London, W.C.2. Price 37s 6d.

As this volume is an elementary textbook intended for the use of students in technical colleges, the consideration which it gives plastic materials from the point of view of the electrical industry is little more than incidental. However, since the author is connected with a company manufacturing plastic components for electrical purposes, he has not by any means overlooked the electrical properties and applications of plastic materials.

As an elementary work on plastics technology the book adequately fulfils its purpose, although workers in particular branches of the industry will notice slight slips and inaccuracies when the author deals with their sphere of activity. The question to be answered is whether this book is likely to be of value to technicians in the electrical industry. Regarding it as a textbook containing an elementary account of the manufacture, processing, properties and application of plastics, it can, in the main, be recommended.—A. A. W.



New French Locomotive

On a recent run this new French electric locomotive, drawing five passenger coaches of the latest type, covered the 361 miles from Paris to Bordeaux at an average speed of 81.4 m.p.h. It reached a maximum speed of 105.6 m.p.h.

Books Received

Principles of Scientific Research. By P. Freedman, B.Sc., M.I.E.E., F.I.E.S. Pp. 222. Macdonald & Co. (Publishers), Ltd., 43, Ludgate Hill, London, E.C. Price 15s.

Lighting Technique. By Prof. B. F. Federov. Translated from the Russian by W. R. Stoker, B.Sc. (Eng.), A.M.I.E.E. Additional sections on fluorescent lighting by W. T. O'Dea, B.Sc., A.M.I.E.E. Hutchinson's Scientific and Technical Publications, Stratford Place, London, W.1. Price 25s.

Problems Have No Sex. By Caroline Haslett, D.B.E., Comp.I.E.E. Pp. 118. Hodder & Stoughton, Ltd., Warwick Square, E.C.4. Price 6s.

Careers in Local Government and Allied Services. By J. B. Swinden. Pp. 180; illus. N.A.L.G.O., 1, York Gate, Regents Park, London, N.W.1. Price 7s 6d.

Canteen Training Centre

LONDON TRANSPORT'S NEW ENTERPRISE

TO provide staff for its 180 canteens, which now serve 50,000,000 meals a year, London Transport has just opened a training centre adjoining Baker Street Station. An up-to-date canteen for railway and other staff has been incorporated in the scheme to give trainees experience under normal working conditions and at the same time provide a ready use for the food prepared in the centre. A general demonstration kitchen and pastry demonstration kitchen, each with adjoining classrooms, enable both theoretical and practical training to be given.

Though steam and gas are employed for the principal cooking appliances, the equipment comprises a considerable amount of electrical apparatus — several grillers (G.E.C.), an egg fryer (Piper & Sons), potato peeling machines (Imperial Machine Co.), a mixer (Peerless Ericsson), cold room (Brett Daniels), refrigerator (Marco), goods lift (W. M. Wadsworth & Sons), floor scrubber and squeegee (Fraser Tuson Products). The lighting generally throughout the building is fluorescent, with half the number of tubes "warm white" and the other half "natural"; B.T.H. "Mazda" fittings and tubes have been employed. Synchronome slave clocks are driven by the master clock in Baker Street station.

Thermostatically controlled radiant panels, steam heated, in the ceiling, warm the building. For ventilation filtered fresh air, warmed over hot pipes, is introduced at several points by fans, being spread by wide diffusing nozzles in the ceilings. Stale air is similarly extracted. In the canteen the air is changed 10 times an hour, and in the main kitchen it can be regulated to between 10 and 40 changes an hour by push-button control in the kitchen. A two-speed fan gives the demonstration kitchens either 15 or 7½ air changes an hour.

Rhodes, Brydon & Youatt "Mopumps" circulate the hot water for the radiant panels and the ventilating system, "Satchwell" thermostats and electromagnetic mixing valves maintaining the temperatures at the desired figures. Bull motors of from ½ to 1¾ h.p. drive the ventilating fans, Brookhirst starters being used. On the main control panel a Negretti & Zambra 8-point distant thermometer gives the temperatures at various positions in the building, other instruments showing the temperature of the water at certain points, the foot-head of water in the system, the pressure of the incoming steam, etc. Sanders "Superior" metal-clad switch-fuses and Siemens lighting and power distribution boards have been installed. The London Transport Signals Department was responsible for the electrical installation, the heating and ventilating work being carried out by Richard Crittall & Co., Ltd.

Canteen at the London Transport Training Centre

London Transport Plans

BAKERLOO LINE EXTENSION : TRAMWAY ABANDONMENT

AT a Press conference last week Lord Latham, chairman of the London Transport Executive, gave some details of important projects which are in hand. He said that work on the extension of the Bakerloo Line from the Elephant and Castle to Camberwell would commence in January next year. Underground tunnelling would start in February or March and it would take two years to complete this extension; it was hoped that the tube would be running early in 1953. It would probably be the biggest compressed-air tunnelling job ever done in London. The extension would provide not only a valuable new service to South London, but improved reversing facilities for trains at the new southern terminus would enable them to increase by 25 per cent the frequency and capacity of the service over the existing line.

Work had also begun preliminary to the conversion of the South London trams. The target date for the beginning of the actual change-over was October next year. The first three tram depots to be converted to bus work would be Wandsworth, Clapham and Camberwell. Special overhead wiring was being installed to allow both buses and trams to use the depots during conversion.

On the rail side London Transport was establishing in the autumn its own mobile radio network to cut down delays caused by Underground breakdowns. The system would operate on a specially allocated G.P.O. wavelength and would have its own call sign. A fleet of ten breakdown vans would be linked by radio telephony with a control centre at Earls Court, and where vans could not get sufficiently close to a job, "walkie talkie" sets, with a range of about one mile, would provide an extra link. Urgent requests from the engineering gangs on the spot for more men or special equipment to clear the trouble would be radioed by the mobile vans and relayed by four receiving stations at East Finchley, Harrow, Leytonstone and Clapham. To send outgoing messages to the vans, they would have their own 100 W transmitting station situated in the tower at London Transport's headquarters.

Their road and rail services this year had broken all records. In the first six months buses, trams, trolley-buses, coaches and the Underground had run 7,000,000 more miles of public services than in the same period of last year. The overall increase in services had been nearly 2½ per cent.

B.S.I. Annual Meeting

AT the 48th annual general meeting of the British Standards Institution last week the president, Lord McGowan, referred to the increased interest in the extension of voluntary standardization on a national basis.

The investigations by the committee for standardization of engineering products under the chairmanship of Sir Ernest Lemon set up by the Ministry of Supply have substantiated the view, long held by British industry, that the principles under which the B.S.I. works are effective and can be considerably extended.

The Anglo-American Productivity Council has recently stressed the importance of standardization and simplified practice. Lord McGowan submitted that there is probably no more effective means for increasing productivity.

Other significant developments during the past year have been the co-operation of the nationalized industries with the B.S.I. and increasing collaboration among large industrial users with a view to assisting manufacturers to reduce the number of types and sizes of their products. This progressive standardization should assist the economy of the country by enabling manufacturers to introduce longer runs and better production methods in their operations. The B.S.I. collaborates with 34 other standard bodies overseas.

Mr. Roger Duncalfe, chairman of the Institution, said that Government and industry have jointly agreed that industrial standardization should be effected through the B.S.I. as the national body and that "industry" included all the great professional institutions.

Sir William J. Larke was elected the new president of the Institution.

Import Licences for Machinery

The section of the Import Licensing Department of the Board of Trade dealing with applications for licences to import machinery has been transferred to 91, Victoria Street, S.W.1 (telephone: Abbey 7898).

Correspondence

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

"Contractors' Confidence"

I MUST congratulate you on the editorial, "Contractors' Confidence," in your 8th July issue. One does not very often have to compliment a technical journal on impartiality and judicial opinions, but I have noticed over the last thirty years the high standard of your paper's opinion when matters of policy have been discussed. I am sure electrical contractors throughout the country must feel that you have presented their case in an unbiased and fair manner.

I shall be very pleased if you can find room in your paper for publishing this.

Walsall. H. F. TRUMAN
(Electrical Contractors' Association).

Registration of Contractors

MR. L. C. PENWILL is surprised at my remarks in your issue of 24th June, and possibly he will be more surprised to learn that I am a member of the E.C.A. of Scotland and a registered contractor, because I believe both those institutions are very useful. I am not likely to change my opinion unless Mr. Penwill can prove me wrong.

Perhaps I did not make myself too clear on the point where I "had ma doots," and I am not denying that the E.C.A. is a voluntary register, but not in the sense I endeavoured to convey. The E.C.A. is essentially a trading association, and it has no means of ascertaining whether its members do good, bad or indifferent work unless someone makes a definite complaint.

If, as Mr. Penwill states, the E.C.A. guarantees good work, can my friend explain why bad installations are so numerous; surely, Mr. Penwill is not suggesting that all the "rotten" work is carried out by people who are members of nothing. I quoted the reports of the Register merely to prove that even registered contractors have "slipped up," but I cannot say whether or not all the defaulters were members of the E.C.A.

Mr. Penwill indicates that his Association does not think compulsory registration can be achieved via the N.R.E.I.C., but gives no reason for that assertion. I maintain that with proper support from the English E.C.A. and the bona-fide installation trade, the N.R.E.I.C. could have been a powerful institution, and I have every reason to believe that compulsory registration would have been accomplished by the influence of the Register.

I may mention that I have a number of friends who are both E.C.A. and N.R.E.I.C. men, and, as it is not possible to deal with this subject properly in a letter, perhaps Mr. Penwill and I may be able to enjoy a friendly bout at a none-too-distant date.

Glasgow. ALEX. MILNE, SENR.

Disposal of Fluorescent Tubes

MAY I suggest to C. W. Waddington, who writes in the *Electrical Review* of 29th July about his trouble in disposing of burnt-out fluorescent tubes, that he should write to the editor of the *British Medical Journal* for their suggested methods of handling these tubes.

A number of cases of poisoning have been traced to cuts sustained by people handling fluorescent tubes. It appears that the powders used to coat the tubes are readily absorbed into the bloodstream; hence the instruction for the wearing of thick rubber gloves.

Glasgow. JAMES YOUNG, M.S.R.

ALTHOUGH Mr. C. W. Waddington is rather surprised at the precautions taken by his local authority, I can quite understand its attitude, as broken tubes can be detrimental to health, owing to sulphur dust penetrating into cuts and abrasions during handling.

As one who is responsible for the disposal of fluorescent tubes, I have always been advised to break these under water, using gloves and goggles as an added precaution, and afterwards burying the remains. All tubes are disposed of in this manner, and never set aside for dustmen or salvage collectors.

Southwold. H. K. CHAPMAN.

Development in Ireland

LARGE CAPITAL PROGRAMME IN HAND

REPORTING to the Minister for Industry and Commerce on its operations during 1948-49, the Electricity Supply Board of Ireland states that the volume of work involved in the present capital programme is unprecedented in the Board's history. Many difficulties have arisen, but the progress made can be regarded as good.

Expenditure on new capital works in course of construction at the end of March last was £5,040,682. The position of the various schemes at that date was as follows:—

Portarlington turf-fired station (two 12,500 kW sets). Construction of electrical plant nearly completed and 110 kV line to Portlaoighise finished, but delay in delivery of steam piping will prevent station being commissioned before end of 1949.

River Erne, Co. Donegal. Cliff station (one 10,000 kW hydro-electric set). Most of material for set delivered and stored. Unit expected to be ready for service in summer of 1950. Cathaleen's Falls station (two 22,500 kW sets). Delay in civil constructional programme owing to shortage of labour will postpone commissioning of first set to winter of 1951.

River Liffey. Leixlip station (one 4,000 kW hydro-electric set). Due to be commissioned this summer.

Allenwood turf-fired station, Co. Kildare (two 20,000 kW steam sets). Work on site started in February. Scheduled for commissioning in spring of 1952.

North Wall oil-fired station, Dublin (one 12,500 kW set). In operation April, 1949.

Pigeon House coal-fired station, Dublin. Two additional 100,000 lb/hr boilers completed; manufacture of new coal-handling plant in progress.

Ringsend coal/oil-fired station, Dublin (two 30,000 kW steam sets). Construction will necessitate major reclamation work. Board aims to have station ready for service by end of 1953.

River Lee, Co. Cork. Scheme submitted to Minister for development of two hydro-electric stations, one at Inishcarra (two 10,000 kW sets) and the other at Carrigadrohid (two 4,000 kW sets). Project expected to take five years to complete.

Lower Hydro-Electric Output

Despite heavy maintenance work and the absence of any margin of plant the total output during the year increased by 90.2 million kWh (14.6 per cent) to 708.6 million kWh the maximum load rising from 170,600 to 187,000 kW. Less favourable water conditions caused a fall in the output from hydro-electric stations (343 million against 422 million kWh). Supplies of coal were adequate, and of improved quality, for the substantial increase in steam-station production, but the price was three times as much as in 1938. A total of 1.7 million kWh was purchased in bulk at Lifford from the Electricity Board for Northern Ireland.

Progress of Rural Scheme

During the year modified restrictions, permitting use of up to 100 per cent of basic consumptions, continued in force. Nevertheless, with the number of consumers increasing from 262,598 to 284,198, sales expanded by 77.1 million kWh (15.7 per cent) to 569.3 million kWh. The rate of development under the Rural Electrification Scheme was accelerated, 32,002 poles being erected, 1,730 miles of line strung, 9,262 consumers connected and thirty areas completed. These figures compare with 15,986 poles, 721 miles of line, 2,203 consumers and seven areas in the previous year. So far 144 areas have been investigated in detail and 64 areas developed or selected for development, covering 1,596 sq miles, or 25 sq miles per area. To reduce costs, steel reinforced aluminium conductor was used on the greater part of the rural network for the first time. Capital subsidies received from the Minister of Finance amount to £725,000, representing 50 per cent of the capital cost, but results so far indicate that this will not be enough to make rural electrification self supporting.

Gross revenue of the Board in 1948-49 amounted to £4,366,013 (against £3,886,479 in 1947-48) and there was a surplus on electricity revenue account of £212,158 (against £74,996). A marked increase in the value of appliance sales from £153,102 to £245,391 resulted in a net profit on merchandise trading of £11,307, and there was also £17,362 surplus on installation work.

As the original contingencies account was exhausted during the war years £200,000 has been transferred to this reserve. Forecasts indicate that to meet the heavy capital investment programme and renewals some upward revision of charges may be necessary unless expenditure can be stabilized or reduced. Revenue per kWh sold has decreased since 1945-46 from 1.94d to 1.83d.

The report of the Board (chairman Mr. R. F. Browne), also includes details of the operation of salmon, eel and oyster fisheries.

COMMERCE and INDUSTRY

Power Plant for Melbourne : Shop Assistants' Wages

A REUTER message from Melbourne reports that the City Council is to buy £A1,000,000 (£800,000 sterling) worth of British generating equipment. British manufacturers have assured the Electricity Supply Committee that they can install a 30,000 kW turbo-alternator and associated steam plant by April, 1952, it was stated by the chairman of the Committee, Mr. O. J. Nilsen.

Copper and Lead Consumption

The output of main copper and alloy products during the first half of this year represented a copper consumption of 255,882 long tons, as compared with 284,826 tons in the corresponding period of 1948. Of the total 112,472 tons (against 107,523 tons) represented high conductivity products.

Lead consumption in the same period was 162,045 tons of which cable making accounted for 61,688 tons and battery production for 13,444 tons in addition to 10,782 tons of oxide.

Anglo-American Trade

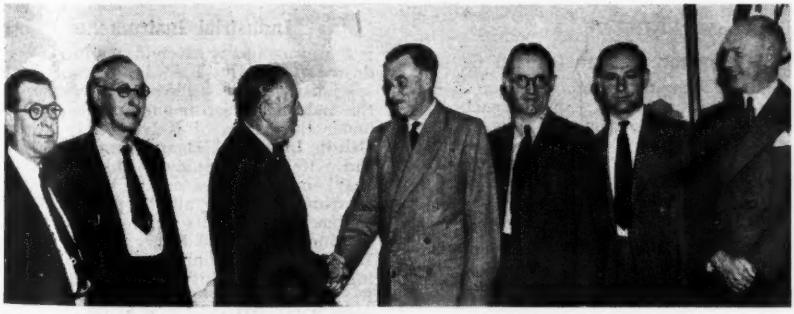
The group of British industrial experts who are at present in the United States under the auspices of the Anglo-American Productivity Council to study simplified practice, recently held a meeting in Washington with Mr. P. G. Hoffman, head of the Economic Co-operation Administration. In an address Mr. Hoffman outlined some of the methods which British manufacturers must adopt to increase the sale of British goods in America. He said that the United States wanted to help British manufacturers bring about conditions in which they could earn more dollars. There were also many things which America had to do to expand her imports. That was a new idea, that they should be an importing rather than an exporting country. But there was a growing realization that unless they imported they could not export.

Mechanical Engineering Congress

In our issue of 13th May we drew attention to the International Mechanical Engineering Congress which is being held in Paris from 12th to 17th September. A detailed programme and registration form are now available from the Publications Division of the British Engineers' Association, 32, Victoria Street, London, S.W.1.

Shop Assistants' Wages

Draft proposals have been issued by the Retail Furnishing and Allied Wages Council relating to wages and conditions in the radio and electrical trades. The grades covered are managers, manageresses, shop assistants, cashiers, central warehouse workers, stockhands, van salesmen and "other workers," and the rates vary for the London and two provincial areas. Managers' wages are based on weekly trade and those of others on age. The proposals deal also with overtime, waiting time, holidays, guaranteed week, etc. The new wages schedules represent a substantial advance on existing rates. Objections to the proposals



British industrialists in Washington with Mr. P. Hoffman, E.C.A. Administrator

Left to right: Mr. G. Weston (deputy) director, British Standards Institution); Mr. C. A. Martin (British Thomson-Houston Co., Ltd.); Mr. P. Hoffman; Major-Gen. J. S. Crawford (director, Guy Motors, Ltd., vice-president of the Society of Motor Manufacturers and Traders); Mr. B. White (technical director, F.B.I.); Mr. C. J. A. Whitehouse (secretary, Ministry of Supply Committee on Standardization); and Mr. R. Neill (director, Lucas Electrical Co., Ltd.)

have to be lodged by 19th August. The secretary to the employers' side of the Council is Mr. H. A. Curtis, F.C.I.S., 26, Fitzroy Square, London, W.1.

Pottery Lighting

The decorating shop in Booths & Colcloughs modern pottery at Stoke-on-Trent has recently been relighted by 102 Revo "Trufolite" reflector fittings, each carrying one 80 W 5ft fluorescent tubular lamp. The very fine nature of the work carried out in this shop demands even, glareless lighting without producing eye-strain or fatigue, and this has been achieved through the combination of fluorescent lighting and compatible colour schemes for walls and roof. In this particular case, the roof and walls are painted light stone, and the fittings are mounted to give a height of 8ft 6in to light centres. The reflectors were manufactured and supplied by the Revo Electric Co., Ltd., and the whole installation was planned and executed in conjunction with Booths & Colcloughs, Ltd., by the Alliance Electric Co., Ltd.

Revo reflectors in a pottery

Refrigerator Manufacture in Greece

H.M. Counsellor (Commercial) at Athens reports that he has been approached by the Bureau de Compensations Privées, P. Mylonas & Co., 78, Rue Eolou, Athens, who are anxious to get into touch with United Kingdom manufacturers of refrigerators not represented in Greece, regarding a proposition to establish an electric refrigerator plant in that country. There is considered to be a good market for electric refrigerators manufactured locally from imported accessories.

Purchasing Officers' Association

The Purchasing Officers' Association recently held a conference of the hon. secretaries of its twenty-four branches and groups at the Grand Hotel, Manchester. This was followed by a dinner to the secretaries given by the Council, at which the principal guest was Mr. E. A. Carpenter, president of the Manchester Chamber of Commerce and a member of the recently formed Dollar Exports Board. In proposing the toast of "The Association," Mr. Carpenter said that the country was suffering from too much of its buying being done by untrained people. In his work with the new Dollar Exports Board he had found that many manufacturers were buying materials at uneconomic prices simply because purchasing was in the hands of a Government Department, and he had no doubt that Government bulk buying was a contributory factor to the situation in which some of the nation's goods were dear in relation to those of its competitors. The country would do better if the people who were trained in buying were given the freedom to employ their skill. If British industry was to hold its own we had better get back as quickly as possible to firm prices and fixed delivery dates.

Power System Analysis

Owing to the number of applicants who could not be admitted to the Vacation School on Power System Analysis which was held at Imperial College, London, last April, the course is being repeated during the week 19th to 23rd September.

Industrial Instruments

A new company, Kelvin & Hughes (Industrial), Ltd., has been formed to specialize in the selling and servicing of the industrial instruments previously sold under the names of Kelvin, Bottomley & Baird, Ltd., and Henry Hughes & Son, Ltd. Kelvin & Hughes, Ltd. (formed in 1947) now operates as the manufacturing company, covering all the production and engineering activities of Kelvin Bottomley & Baird, Ltd., and Henry Hughes & Son, Ltd., at their Hillington (Glasgow), Barkingside and Basingstoke factories. Mr. F. A. King, after forty years' association with Kelvin Bottomley & Baird, Ltd., has retired from the position of joint managing director of Kelvin & Hughes, Ltd., and is now a consulting director. Mr. G. B. G. Potter becomes sole managing director; otherwise the board remains unchanged

with Sir Frederick Stewart as chairman and Sir Allan Gordon-Smith as deputy chairman. Mr. W. R. E. Kent, B.A. (Eng.), A.M.I.Mech.E., A.M.I.E.E., has been appointed as director and general sales manager of Kelvin & Hughes (Industrial), Ltd., and will operate from the main sales office at 2, Caxton Street, London, S.W.1, with another sales office at 110, Bothwell Street, Glasgow, C.2.

Broadcasting in Sweden

The Swedish Broadcasting Administration is in the process of replacing some of its old type transmitters by more up-to-date high-power equipment.

Of three high-power transmitters ordered from Standard Telephones and Cables, Ltd., London, two have recently been put into service — a 150 kW station at Sundsvall in the north, and a 100 kW station at Hörby in the extreme south of Sweden. The third transmitter for Göteborg on the west coast is scheduled to be in operation next year.

These three stations combined will complete the coverage of the middle and southern parts of Sweden in the medium wave band. The more sparsely populated mountain areas are catered for by several small stations and wired wireless. Up to the present time fourteen radio broadcasting transmitters have been supplied by Standard Telephones and Cables, Ltd., to the order of the Swedish Broadcasting Administration.

Induction Face Hardening of Armour Plate

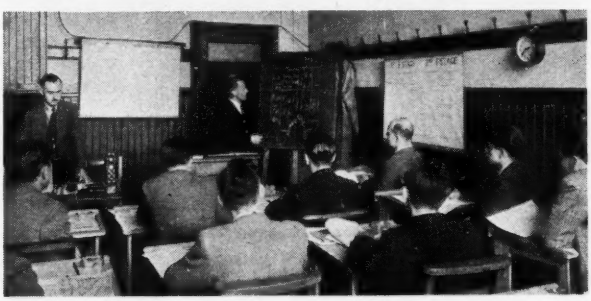
Summaries of Board of Trade reports on German industry which have not been considered suitable for printing include "Electrical Induction Face Hardening of Thick Armour Plate" (CIOS. xxvii—75). The report itself may be inspected at the Technical Information and Documents Unit, 40, Cadogan Square, London, S.W.1, reference FD 1016/49.

Interior Lighting Code

The make-up of the new edition of the I.E.S. Code for interior lighting has been changed and its appearance improved. It is now printed on art paper with a stiff red cover. The charts of recommended levels of illumination for different activities are printed in colour on a graded background, thus demonstrating the effect of difference in contrast between objects of various sizes and background, which explains why more light is needed when contrast is poor. The recommendations cover both natural and artificial illumination inside buildings of all sorts from homes to factories. Copies of the Code are obtainable for 2s 6d from the Illuminating Engineering Society, 32 Victoria Street, London, S.W.1.

Television Training Scheme

The General Electric Co., Ltd., is providing for its approved radio dealers in the Midlands two television training centres, one in Birmingham and one in Leicester. The object of this scheme is to ensure that all G.E.C. dealers are competent to demonstrate and to maintain the high standard of G.E.C. television receivers long after they have left the company's works. The course takes five days, the first two being allocated to a brief introductory talk on the fundamentals of television and a thorough technical description and explanation of the circuits involved. The remainder of the period is occupied by practical work and each dealer has ample opportunity of setting up television receivers, and localizing and rectifying faults. The accompanying picture shows a class at Birmingham receiving instruction in the operation of a time base circuit.



Radio dealers at the G.E.C. Birmingham Television Training Centre

Brush Group Journal

To link together the growing organization of the Brush Electrical Engineering Co., Ltd., and associated companies a Group Journal has been published. The first issue (July) contains messages by Sir Ronald Matthews, chairman of the Brush Company, and Mr. Alan P. Good. In addition to news of many social activities there is an article on the central labora-

tories of the Group by Mr. G. H. Wray, while Mr. Joseph White, managing director of Brush (South Africa), Ltd., surveys progress in the Union.

Lighting Display for Confectioners

Members of the Institute of Chocolate and Confectionery Distributors recently visited the Lighting Service Bureau where, in the shop lighting section, they inspected a special display of confectionery under various types of lighting. The display had been arranged as some of the members had experienced difficulty in deciding which combinations of present-day lamps were suitable for use in their windows.

Confectioners at the Lighting Service Bureau

Another Lead Price Increase

After we had gone to press last week with an announcement that lead and zinc prices had been increased, statements were issued by the Ministry of Supply to the effect that the price of good, soft pig lead had been further raised to £85 2s 6d a ton—£2 15s increase.

Trade Announcements

Tilling-Stevens, Ltd. (Electrical Sales Department), have appointed the Holland House Electrical Co., 221, St. Vincent Street, Glasgow, and branches, and Simpson, Baker & Co., 1/3, Broadmead, Bristol, and branches, to act as distributors.

The Rapid Magnetting Machine Co., Ltd., Birmingham, has entered into an agreement with Dings Magnetic Separator Co., of Wisconsin, U.S.A., for the exchange of technical information and for a licence to manufacture certain products so far exclusively made in the United States. This special equipment will now be manufactured in this country for both home and export markets. Mr. W. B. Lane, managing director of the Rapid Magnetting Machine Co., Ltd., is at present on an extended tour of the United States and Canada.

Batti-Wallahs' Society

After-lunch talks on a variety of subjects have been given at the monthly luncheons of the Batti-Wallahs' Society, but none has been more appropriate, after an excellent lunch, than that given by Mr. Lindsay Ring on good wine, food and cigars at last week's luncheon of the Society. Mr. Ring is a principal of Ring & Brymers (Birch's), Ltd., the well-known caterers and is an authority of international repute on the subject of catering. In his entertaining talk he not only gave some indication of the skill involved in the making of cigars and the bottling of wine, but also gave some useful hints on how to distinguish the good from the lesser kind, armed with which we shall in future be able to show greater discrimination in our selection.

We were glad to hear from the "Mate," Mr. A. H. Hughes, that Col. Sir Thomas Purves, who has been ill, is making a good recovery. As in previous years there will be no luncheon of the Society in August.

Electrical Employment

The number of persons employed in the electrical manufacturing, contracting and electricity supply industries in Great Britain in May totalled 719,500, according to the *Ministry of Labour Gazette*. This compares with 721,500 in the previous month and 721,900 in mid-1948. At 13th June last there were 4,932 persons registered as unemployed in the electrical manufacturing industry, 1,440 in electrical wiring and contracting, and 694 in the electricity supply industry.

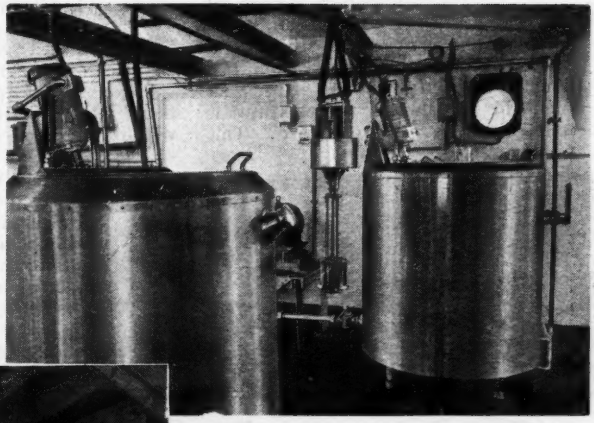
"Cooker Components"

In the notes under this heading in our issue of 1st July (p. 19) the address of Parnall (Yate), Ltd., was incorrectly given. The company's London address is 43, Park Street, W.1.

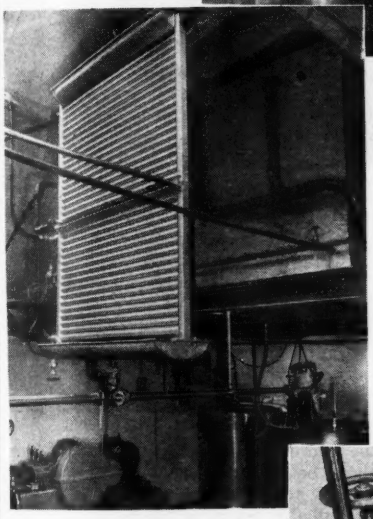
Ice Cream Manufacture

NEW FACTORY IN NORTH LONDON

RECENTLY we inspected a new ice-cream-producing plant which has just been built in North London for Melbray Ices, Ltd. This plant is completely hygienic, and has been designed so



100-gallon steam jacketed pasteurizer (right) and ageing vat (left). The portable emulsifier between these two units may be used in association with either

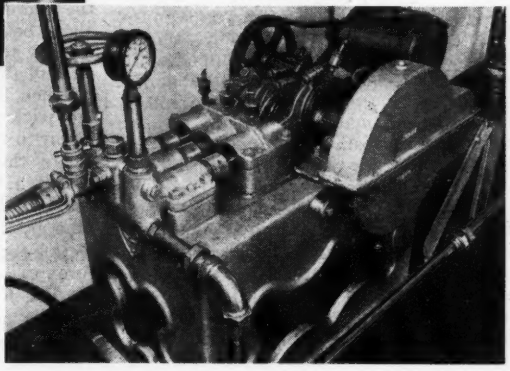


This milk cooler lowers the cream temperature from 160 deg F to 40 deg F

that during the entire process the product is untouched by hand. It is electrically operated, many of the machines being automatic, and is capable of a maximum output of 5,000 4oz tubs of ice-cream an hour.

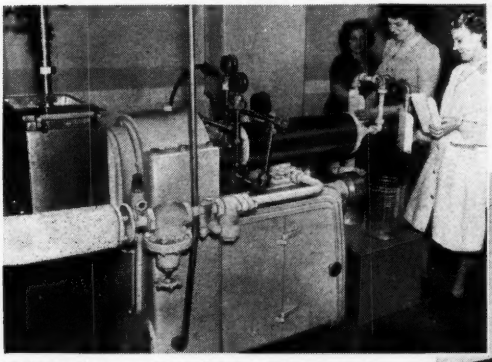
The process commences when the "mix" is placed in a 100-gal. steam-jacketed pasteurizer which raises it to a temperature of 200 deg F. This appliance incorporates a 0.5 h.p. motor driving an agitator at 70 r.p.m. through reduction gearing, and may be associated with a 1 h.p. portable emulsifier which is capable of dealing with 100 gallons in half an hour. As this stage of the process needs careful control, the conditions obtaining in the unit are electrically recorded on a chart

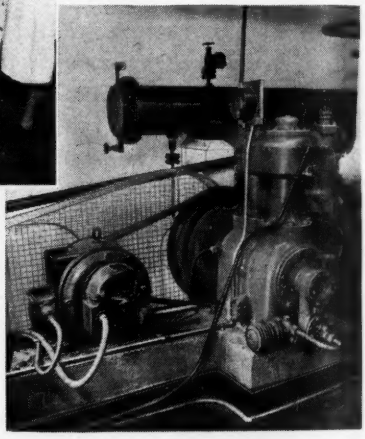
After pasteurization the cream is passed through this homogenizer



so that the operator can make any adjustments which may seem necessary.

After it has remained in the pasteurizer for the appropriate length of time, the cream is passed through a 2,500 lb/sq in homogenizer driven by a 5 h.p. squirrel-cage motor. From this point it is pumped to the top of the milk cooler, in which its temperature is lowered from 160 to 40 deg F. This





The maximum output of this Vogt freezer is 60 gallons an hour, and the ammonia compressor (right) circulates three tons of refrigerant an hour around the freezer

cooler will handle 100 gallons an hour, and comprises a system of horizontal pipes, one below the other, through which the refrigerant is pumped, the associated compressor being driven by a 3 h.p. induction motor.

The liquid is then transferred to either of two ageing vats of 100 gallons and 50 gallons capacity respectively, where, in accordance with Government regulations, it is maintained at 40 deg F for a stated period. The larger vat is equipped with a 50 r.p.m. agitator powered by a 0.5 h.p. motor, the refrigerant being supplied by a conventional 0.5 h.p. unit. Both vats are thermostatically controlled and, if necessary, they can be universally connected for increased output.

The mixture is then delivered to a Vogt freezer, the maximum output of which is 60 gallons an hour. A Lightfoot ammonia compressor driven by an 8 h.p. slip-ring motor circulates refrigerant around this unit at the rate of 3 tons an hour, the whole being mechanically and electrically interlocked and furnished with high- and low-pressure control. The Vogt freezer itself, from which 5,000 4 oz tubs may be filled in an hour, is driven by a 7 h.p. squirrel-cage machine, and is equipped with an auto starter and arrangements for remote control.

Steam for the pasteurizer and equipment used to sterilize machine parts which come into contact with the product is generated by a Brockhouse boiler, the pump for which is driven by a $\frac{1}{3}$ h.p. induction motor. The unit embodies high- and low-pressure control arranged in conjunction with the safety valve so that if the latter operates the motor automatically stops and an alarm bell is sounded. When the pressure returns to normal, the bell is switched off and the pump motor restarts.

When the tubs have been filled, they are packed in cardboard cartons and taken to the "hard room" (cold room), where they are stored until ready for despatch. This room has a capacity of 1,000 cu ft, and is divided into two sections by means of double flap doors, one section being maintained at a temperature of −12 deg F., and the other at −7 deg F; entrance from the factory is through an air lock. The refrigerating compressors for these cold rooms are

driven by a 5 h.p. 480 V d.c. motor and a 3.5 h.p. d.c. machine respectively, both units being furnished with thermostatic control, automatic starting gear and pressure controls. These machines are operating on a temporary basis only, and will be replaced by a.c. motors.

The electrical installation, including lighting and heating, is carried out in not less than ¾in galvanized screwed conduit, fixed to the walls and ceilings by spacer bar saddles, with terminations at motors and starters in watertight flexible metallic conduits with soldered brass unions. Siemens v.i.r. cables are used throughout. The main switch and distribution gear, which is fixed on an angle iron panel adjacent to the cold-room compressors, comprises a 60A triple-pole and neutral switch-fuse controlling an 8-way triple-pole and an 8-way triple-pole and neutral ironclad distribution board.

The main refrigeration and installation engineers were the Auto-Cold Refrigeration Co., Ltd., the sub-contractors being Cherry Burrell, Ltd. for ice-cream-making machines and the Lightfoot Refrigeration Co. Ltd., for refrigerating equipment. The electrical installation was made by the Universal Electrical Equipment Co., of 167, Norwood High Street, London, S.E.27.

Malayan Electrical Imports

CONTINUATION OF RECOVERY

OFFICIAL accounts of the external trade of Malaya for 1948 have now been issued. Items relating to electrical imports have been extracted and are shown below with the principal countries of supply and notes of increases or decreases compared with 1947. Comparative figures for lamp imports are incomplete because of change in classification. Value in 1948 in Malayan dollars of flashlight and similar types were: 385,000; other bulbs not exceeding 24 V, 6,600; fluorescent, 325,000; other discharge lamps not exceeding 300 V, 119,000, and other bulbs not exceeding 24 V, 942,500.

All important lines except batteries and complete radio sets showed increases. These were noteworthy in lighting accessories, wires and cables (save submarine), and telegraph apparatus. Canada and Australia appeared as competitors in the expanding market for accumulators, and India and Japan in that for fans. Australia supplied some generating plant and Holland some of her traditional lines. The total value of the electrical machinery trade was 3,216,000 Malayan dols. compared with 2,133,000 in 1947 and of the electrical apparatus trade 29,015,000 Malayan dols. against 21,680,000 in 1947. (The Malayan dollar equals 2s 4d).

According to a recent statement by Mr. Malcolm MacDonald, since last November no major damage has been done in Malaya, and the output of rubber and tin has increased.

Class	1948 $(000)	Inc. or dec. on 1947 $(000)
Automobile lamp bulbs	98	+ 74
From U.K.	22	− 81
,, *U.S.A.*	93	− 1
,, *Holland*	19	+ 7
Flash and torch lamp bulbs ...	44	− 101
From Holland	20	+ 20
,, *U.S.A.*	15	− 12
Elec. hand flash lamps	1,247	+ 213
From Honghong	1,125	+ 294
,, *U.S.A.*	62	+ 11
,, *Holland*	8	+ 4
Elec. lighting accessories	2,038	+ 1,173
From U.K.	1,889	+ 1,204
,, *Australia*	18	− 82
,, *U.S.A.*	70	− 30
,, *Honghong*	23	+ 10
Wires and cables, not telegraph or telephone, rubber insulated ...	3,019	+ 557
From U.K.	2,973	+ 495
,, *U.S.A.*	16	+ 14
Ditto, insulation other than rubber	1,112	+ 547
From U.K.	1,085	+ 573
,, *U.S.A.*	23	+ 21
Ditto, telegraph and telephone ...	534	+ 418
From U.K.	508	+ 398
,, *U.S.A.*	26	+ 26
Ditto, submarine	421*	− 288
Electro-medical apparatus, X-Ray and vacuum tubes	259	+ 206
From U.K.	142	+ 104
,, *U.S.A.*	108	+ 93

Malayan Electrical Imports (Cont.)

Class	1948 ($000)	Inc. or dec. on 1947 ($000)
Elec. instruments not telegraph or telephone	736	+ 421
From U.K.	688	+ 321
,, *U.S.A.*	11	− 30
Elec. refrigerator and parts	3,355	+ 1,115
From U.K.	145	− 16
,, *U.S.A.*	2,936	+ 1,024
Electric fans	1,227	+ 556
From U.K.	996	+ 460
,, *India*	135	+ 84
,, *Japan*	17	+ 17
,, *Italy*	47	+ 34
Accumulators, wet	597	+ 574
From United Kingdom	405	+ 382
,, *Canada*	88	+ 88
,, *U.S.A.*	25	+ 25
,, *Australia*	79	+ 79
Batteries	774	− 812
From U.K.	533	− 583
,, *Australia*	38	− 12
,, *U.S.A.*	91	− 50
Ditto for hand flash lamps	2,279	+ 58
From Canada	716	+ 716
,, *United States*	1,169	+ 858
Radio receiving sets, exclu. valves	3,022	− 376
From U.K.	2,339	− 229
,, *Holland*	481	+ 195
,, *U.S.A.*	135	− 124
,, *Australia*	49	− 53
Radio transmitting sets exclu. valves	272*	+ 17
Radio valves	246	+ 111
From U.K.	214	+ 89
,, *Holland*	5	+ 3
,, *U.S.A.*	27	+ 21
Radio parts and accessories	868	+ 466
From U.K.	744	+ 386
,, *Holland*	20	+ 10
,, *U.S.A.*	60	+ 32
Telegraph and telephone apparatus other than radio	1,147	+ 530
From U.K.	1,120	+ 513
,, *U.S.A.*	14	+ 10
Elec. goods and apparatus n.e.s.	3,414	+ 1,122
From U.K.	3,000	+ 1,030
,, *Canada*	123	+ 78
,, *Holland*	31	+ 21
,, *Australia*	46	− 47
,, *France*	6	− 6
,, *U.S.A.*	191	+ 55
Convertors and transformers	291	− 125
From U.K.	269	− 106
,, *U.S.A.*	17	—
Generators	916	+ 473
From U.K.	362	+ 148
,, *Australia*	69	+ 40
,, *U.S.A.*	468	+ 274
Motors, 25 h.p. and under	615	+ 200
From U.K.	492	+ 136
,, *U.S.A.*	113	+ 82
Motors, 26 h.p. to 100	166	− 24
From U.K.	144	− 34
,, *U.S.A.*	11	+ 11
Motors over 100 h.p.	249*	+ 106
Switchgear	307	− 7
From U.K.	271	− 18
,, *U.S.A.*	33	+ 22
Other elec. machinery	672	+ 460
From U.K.	586	+ 426

* All or mainly from U.K.

Danish Electrical Trade

LAST year Denmark exported more electrical goods than she imported and increased this trade by more than one third. Its total value amounted to kr. 53 million against about kr. 39 million in 1947. Chief customers were Norway, Sweden, Finland and Holland. (19⅓ Danish kr = £1).

Imports of electrical goods last year rose by about 12 per cent compared with 1947. The total was kr. 52 million against kr. 46 million in 1947. Denmark's principal suppliers of these goods in 1948 were Great Britain, Sweden, the United States and Belgium.

EXPORTS

Class	1948 Kr(000)	Inc. or dec. on 1948 Kr(000)
Dynamos, motors, convertors, etc.	5,099	+1,790
Battery parts	6,366	+1,789
Accumulators and parts	658	− 341
Incandescent lamps	304	− 94
Radio valves	223	− 191
Radio material	8,641	+3,426
Telegraph and telephone material	1,085	+ 415
Cable and wire	2,093	+1,806
Vacuum cleaners	1,785	− 126
Electrical porcelain	2,816	− 122
Installation material	14,429	+2,956
Electrical material unspecified	8,149	+1,832

IMPORTS

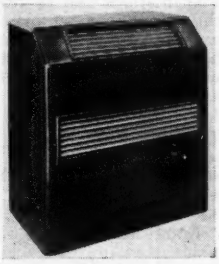
Class	1948 Kr(000)	Inc. or dec. on 1947 Kr(000)
Dynamos, motors, convertors, etc.	12,185	+3,075
Accumulators	339	+ 48
Incandescent lamps	4,157	+1,091
Radio valves	3,869	− 622
Radio material	3,865	− 5
Telegraph, telephone and radio transmitting apparatus	5,232	−1,398
Cable and wire	2,304	−1,606
Vacuum cleaners	99	+ 89
Electrical apparatus, unspecified	12,415	+2,947
Electrical porcelain	172	+ 54
Installation material	3,751	+1,508
Other electrical material	3,404	+ 921

RECENT INTRODUCTIONS

NOTES ON NEW ELECTRICAL AND ALLIED PRODUCTS

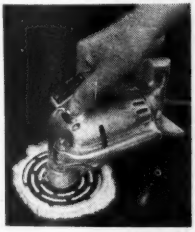
Self-Contained Air Cooling Unit

THE "Climatizer" self-contained air cooling unit made by F. H. BIDDLE, LTD., 52, Clerkenwell Close, London, E.C.1, has a cooling capacity under summer heat and humidity conditions of nearly 8,000 B.Th.U. per hour when the outdoor temperature is as high as 105 deg F. As the room is cooled excess moisture is condensed and drained away outside the room. Air is filtered and circulated at the rate of 300 cu ft/min, of which up to 20 per cent may be constantly induced from outside if it is desired to maintain a steady rate of positive ventilation. The direction of the cool air discharged from the unit is adjustable through an angle of 90 deg.



"Climatizer" air cooling unit

A compact, quietly running condensing unit driven by a 1 h.p. motor is housed in an attractive steel cabinet measuring 38in long by 39½in high by 21 in deep and finished in brown ripple with bronze air inlet and discharge louvres. The installation of the unit requires only the provision of a suitable weathered air connection from a window or wall opening, together with electrical service and condensate drain pipe. The price of a single unit is £210.



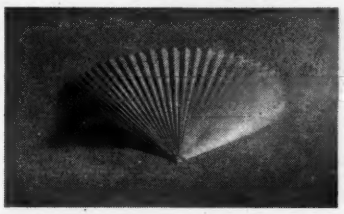
"Handyman" sanding and polishing machine

Sanding and Polishing Machine

Weighing only 6lb, the "Handyman" light industrial electric sanding and polishing machine is portable and can be operated easily with one hand, though a secondary handle fitting into the contour of the machine when not required can be opened out to two positions at the operator's discretion. The alternative heads, which consist of a sander, lamb's-wool polisher and felt pad for applying polish, are easily attached or removed. The robust universal motor is operated by a thumb switch and a radio interference suppressor is incorporated. The machine, which costs £9 19s 6d complete with standard heads, is made by ELECTRIX, LTD., Sterling Works, Dagenham.

Ceiling Lighting Fitting

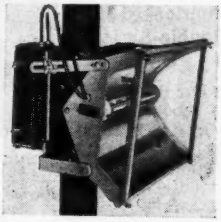
A fluted conical lighting fitting which fits right up close to the ceiling is a novelty introduced by the STERLING LEAF MANUFACTURING CO., LTD., 50, Ledbury Road, London, W.1. Though when installed the fitting is 30in. in diameter, it is supplied in a cardboard container measuring only 5½in wide by 2½in deep by 20in long. A ring with three wired lampholders supplied fits over the ceiling rose cover to which the shade is also attached by means of a string passing through the bottom and wound round and finished off in a slotted wooden button. The varnished parchment of which the shade is constructed is easily kept clean with the aid of a damp cloth.



Sterling lighting fitting

Aircraft Visual Landing Aid

A lighting fitting has been designed by the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, to take the sodium lamps used in horizontal bar lighting which is a visual landing aid for aircraft. It comprises a 140 W sodium lamp mounted

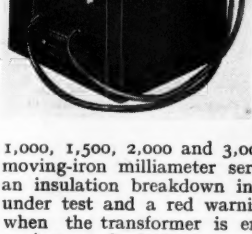


G.E.C. sodium approach light for horizontal bar landing systems at airfields.

horizontally in front of a reflector of high-purity anodized aluminium, the assembly being clamped between cast alloy end pieces. A "Perspex" panel in front of the lamp and windows of the same material in the end pieces ensure a wide horizontal spread of light. The fitting is carried in adjustable mounting stirrups and is furnished with a mercury level which is calibrated in degrees to indicate the angle of elevation of the beam. The clamps for attaching the light to a post also carry at the rear a weather-proof case containing the transformer, fuses and capacitor for power factor correction

Flash Testing Equipment

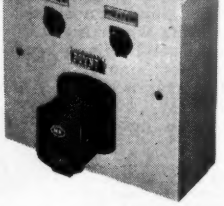
A portable insulation flash tester has just been placed on the market as Model HF.1 by F. C. HEAYBERD & Co., LTD., Greenwich South Street, London, S.E.1. It incorporates a double wound impregnated transformer connected to a rotary selector switch to provide testing voltages of 500, 1,000, 1,500, 2,000 and 3,000 V. A 2.5in moving-iron milliameter serves to indicate an insulation breakdown in the apparatus under test and a red warning lamp shows when the transformer is energized. The equipment also includes a pair of heavy-duty spring loaded testing prods. Normally the testing points are concealed but by a slight thumb pressure on the bottoms they become exposed and are ready for use. The complete unit is housed in a sheet-metal case with a carrying handle and has a black crackle finish.



Heayberd portable insulation flash tester

Interlocked 30 A Double-Switch Units

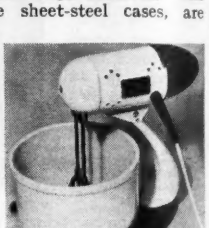
For the control of cookers and water heaters, etc., where, owing to present conditions, it is necessary to restrict the peak load to a minimum when installing additional appliances or apparatus, POYNT PRODUCTS, LTD., 392, Bath Road, Slough, now have available interlocked 30 A double-switch units both with and without an additional 13 A 3-flat-pin socket and switch fuse plug. A semaphore indicator is provided on each switch and a positive internal mechanical interlock ensures that only one of the two switches can be closed at one time. The interlock can be readily removed once the restrictions on maximum demand are withdrawn, but in the meantime sealing the box prevents unauthorized removal. The units, which have sheet-steel cases, are arranged for surface mounting. The 30 A switch units are also supplied mounted separately.



Poynt interlocked 30 A double-switch unit

Food Mixer

From meringue mixture to the thickest pudding the "Opifex" food mixer marketed by R. J. WHITE & SONS (ORPINGTON), LTD., 17, Stowe Road, Orpington, can be used with equal success. The loading is only 85 W and the machine-cut gears give three speeds. The stainless steel plug-in paddles can be used together or singly according to the consistency of the mixture. The machine, which is 12in by 8in by 11¼in overall, is finished in white enamel with a black base. Including purchase tax, the price is £17 10s.



"Opifex" food mixer

Translucent Sign Material

An addition to the interlaminate printed and standard engraved signs in "Traffolyte," a laminated plastic made by THOMAS DE LA RUE & Co., LTD., Plastics Division, 84, Regent Street, London, W.1, is the translucent engraved material. It is used mainly for signalling and electrical equipment, signs in cinemas and dark rooms, etc., letters being engraved in the material so that they appear against a contrasted background when lit from behind. The material is available in black or white for the opaque section with contrasting translucent lettering in ivory, red or green.

Hair Dryer

The SENIOR LIGHTING Co., LTD., Church Street, Staines, states that its hair dryer, described in our issue of 1st July, carries a twelve, not six months' guarantee, as we were informed originally.

Electricity Supply

Fluorescent Street Lighting : Stratford Overhead-Line Inquiry

WEDNESBURY Town Council last week agreed to apply for a loan of of £14,000 to take down all old gas lamps and replace them with fluorescent lamps in all main shopping streets to the borough boundaries at Moxley and the Bull Stake, Darlaston. Alderman G. W. Price described it as the greatest street lighting scheme the Council had ever undertaken.

Electricity Output

During the week ended 22nd July 714.6 million kWh was sent out for public supply from solid-fuel-fired stations of the British Electricity Authority and North of Scotland Hydro-Electric Board. This was 7 million kWh more than in the previous week and 41.9 million above the output in the week ended 23rd July, 1948.

Stratford Inquiry

Although approved by the county planning authority, a proposal by the Midlands Electricity Board to erect overhead lines to supply farms near Stratford-on-Avon is being opposed by the Town Council. A public inquiry into the matter was held recently by Mr. H. W. Grimmitt, Ministry of Fuel and Power inspector, when Mr. G. P. Wilson, on behalf of the Board, said that they also were interested in the historic part of the town and realized that there was a question of amenities and good manners towards the countryside. The two farms, however, were away from the built-up part of Stratford. Underground cables would increase the cost by some £3,400. Mr. P. C. Smart, borough engineer, asserted that the encroachment of overhead lines must stop somewhere.

Edinburgh Tariffs

A recently issued booklet setting out the scale of charges and conditions applicable in the Edinburgh area of the S.E. Scotland Electricity Board also contains details and illustrations of the Board's selling activities. It is pointed out that the Board and electrical contractors co-operate to ensure that all apparatus and appliances are of the highest standard and consumers are asked to consult them and not allow "amateurs" to try their hand at repairs and installation.

Lanark Conversion

Gas lamps at Lanark are to be replaced by electric lamps at an estimated cost of £2,489. The decision to proceed with the scheme was made by the Town Council last week. The new lighting will be by mercury vapour lamps.

Corby Street Lighting

An installation of eight C.12492 "Soletern" lanterns, manufactured by Revo Electric Co., Ltd., has recently been put into operation at Corby. Each lantern has two 5ft 80 W "warm-white" fluorescent lamps, and the scheme is planned in accordance with the principles of the M.o.T. Final Report to provide 4,280 lumens per 100ft linear of road.

Fluorescent lighting at Corby

Portishead Plans

At a conference on the Portishead power station project Mr. J. T. H. Legge, divisional controller, South Western Division, B.E.A., told the Urban District Council that Portishead railway station would have to be moved to a site opposite the Council Offices. The whole of Bailey's Mill, a considerable part of the land at present used for railway sidings and part of the docks would have to be acquired for the new

power station, which would cost some £14 million and would be about 1½ times the size of the present station. The first of six generators totalling 360,000 kW would, it was hoped, be operating by the end of 1952.

Street Lighting Inspection

The Mayor and councillors of Swinton and Pendlebury visited Leigh and Newton-le-Willows recently in order to inspect the modern street lighting in both townships. They were welcomed by the Mayor of Leigh, Councillor Hourigan, J.P.; Alderman Newton, J.P., the chairman of the Street Lighting Committee; Councillor Mrs. E. Crouchley, chairman of Newton Urban District Council; Councillor Gaskin and Councillor Selwyn Jones, J.P. The visit was arranged by the North Western Electricity Board, and Mr. T. Parkinson explained all details with regard to the various types of lighting.

Malvern Hills Proposal

When the Planning Committee's objection to the proposed overhead line over Malvern Hills came before Worcestershire County Council last week, Alderman W. S. Lane expressed the view that they should be very careful indeed about doing anything to restrict the development of the electricity service. He did not think the line on the suggested route would interfere seriously with the amenities. The Planning Committee has authorized the county clerk to object to the proposed line. Opposition is also being offered by Malvern U.D.C. as well as the Malvern Hills Conservators, but Ledbury Rural District Council has agreed to the scheme.

Coal Quality

THE second annual report of the Industrial Coal Consumers' Council, set up under the Coal Industry Nationalization Act to watch the interests of consumers, says that it is encouraging to note that, in the first year's operation, the British Electricity Authority, in collaboration with the National Coal Board, has been able to secure more consistent quality of coal delivered to industrial stations. The Council is aware that in some areas some dissatisfaction with the quality of industrial coal is due to opencast, and the hope is expressed that great care will be taken in the selection of new sites.

The Council accepts the justice of fixing prices on the basis of one price for each coal irrespective of the use to which the coal is put, but it is realized that the correction of anomalies cannot suit everyone. The improvement of weighing and checking facilities by the National Coal Board should go a long way to reduce the problem of short weight. The Board is negotiating with the Railway Executive on loss of weight during transport. In 1948 twenty-three coal cleaning plants were brought into operation, and about two millions more tons of dirt were removed from coal in 1948 than in 1947.

Dolgarrog Application Withdrawn

THE British Electricity Authority has withdrawn its application to the Minister of Fuel and Power for an authorization in respect of the suggested extension of the catchment area of the Dolgarrog hydro-electric scheme, North Wales. The Authority says that while it is fully concerned to secure the preservation of other amenities as well as the provision of electricity it has decided, in view of the objections lodged against the Dolgarrog proposal and of similar objections in the press to the other hydro-electric schemes which are being investigated, that it will not proceed with the Dolgarrog project as a separate matter, and that all the proposed schemes for hydro-electric development in North Wales shall be dealt with collectively by Parliamentary procedure. By this procedure the Authority desires to ensure the fullest opportunity for detailed examination of its proposals, together with due consideration of any objections.

B.E.A. Contracts

DURING the past month contracts have been placed by the British Electricity Authority for generating station, switching and transforming station and transmission equipment amounting in the aggregate to £2,877,386. The principal contracts include: Structural steelwork, Woolwich generating station (Redpath, Brown & Co., Ltd.); two 240,000 lb/hr boilers, Acton Lane (Willesden) station and coal handling plant, Thornhill station (Mitchell Engineering Ltd.); circulating water ducts and coal store drainage, Accrington station (J. Jarvis & Sons, Ltd.); reconstruction of coal sidings, Leicester station (Holloway Bros. (London), Ltd.); switchgear and miscellaneous electrical equipment, Brighton "B" station (Metropolitan-Vickers Electrical Co., Ltd.); foundations, Carrington station (A. Monk & Co., Ltd.); and superstructure of main and ancillary buildings, Westwood (Wigan) station (Wm. Moss & Sons, Ltd.).

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

Revo Electric Co., Ltd.—Addressing the shareholders at the company's annual meeting on 28th July, the chairman (Mr. Bertram Silcock) said that conditions during the past year were not so favourable. Rising wage costs quickly swallowed up profit margins if productivity was not increased. Higher fuel costs had also increased costs. Production had not been unsatisfactory having regard to quotas, electricity restrictions and changes in the avenue of sales.

Included among the developments which were contemplated were an extension of the concrete lamp column factory and the more satisfactory housing of the research and development. Mr. Silcock referred to the Company's new lighting fittings and said that the Company now had a fully equipped and staffed street lighting installation service. The pressure die cast metal section of the switchgear department was being further mechanized.

Sales in the domestic appliance department were not so high as anticipated on account of purchase tax and restricted quotas. The electricity authorities had now re-introduced hire schemes and had extended hire-purchase arrangements, particularly of electric cookers. This had stimulated demand and more orders are being received. Several new designs of cookers had been introduced particularly for export. Owing to the 1948 price freezing Order they had been unable to increase prices of certain domestic appliances and had had to bear the increased costs.

As regarded exports it had been officially said that British prices are too high but each year they had to contend with rising costs. If prices were to be reduced costs must also fall or at least remain static. The Company enjoyed a good reputation and could look forward confidently to the future.

In conclusion, the chairman referred to the retirement in March of Mr. Reeves, joint managing director with Mr. Felton, who had been with the Company since its inception.

Cawnpore Electric Supply Corporation, Ltd.—Mr. K. A. Scott-Moncrieff, M.I.E.E., in his speech at the annual meeting on 28th July, said that during the past year the company had been engaged in settling a large number of matters in connection with the valuation of the undertaking. Their experts' valuation had now been forwarded to the United Provinces Government. The suit which they had filed against that Government would, they had every reason to think, be heard early in September. They had received £1,501,283 on account and pending a settlement £877,644 of their funds was "frozen." The board was anxious to place the company into liquidation as soon as possible but no funds were available for distribution until they knew more about the valuation.

The Kalgoorlie Electric Power & Lighting Corporation, Ltd., held its annual meeting on 27th July, when Mr. A. J. Fippard (chairman) said that good progress had been made with the extensions to their plant. Two of the twelve new boilers had been delivered and plans were well ahead for the erection of the new boiler house. It was anticipated that this part of their programme would be completed by mid-1951 and that the boilers would be in use by the beginning of 1952. The new boilers were adapted for burning coal and would be provided with mechanical stokers fed automatically by coal handling plant. In view of the protracted deliveries of the plant needed to effect their complete reorganization, the board had decided to carry out the plant extensions in two phases. The first phase comprising the installation of the boiler plant and the second the installation of generating plant. To this end it was proposed to raise further capital at an early date of an amount which, with their existing resources, would be adequate to finance additions.

The General Electric Co., Ltd., in a preliminary statement, shows that the aggregate profit of the group, before United Kingdom and overseas taxation and proportion attributable to minority shareholders, amounted to £3,776,504 for the year ended 31st March last, as compared with £4,471,730 for the preceding year. The consolidated net profit attributable to the holding company, after tax, is £1,487,131 (against £1,758,010) and the consolidated net profit dealt with in the accounts of the holding company is £1,225,351 (against £1,478,863). It is proposed to pay an ordinary dividend for the year of 10 per cent, plus a cash bonus of 7½ per cent, both less tax. This is at the same rate as for many years past. The annual meeting of the company will be held on 29th September.

Ruston & Hornsby, Ltd.—Speaking at the annual meeting held on 28th July, Mr. J. H. W. Pawlyn (chairman) said that all their subsidiary and associated companies had had a good year. The operating results of Davy, Paxman & Co., Ltd., were exceptionally good and followed on an exceptionally high volume of activity arising

out of a large programme to meet the demand for stand-by electrical generating sets consequent upon the national fuel crisis of 1947. This programme was coming to an end and some falling off in profits had to be anticipated. Their Australian and Indian subsidiaries had had a successful year with highly satisfactory figures for turnover and profits. The favourable results which they now showed had been considerably influenced by the introduction of new plant and equipment consequent upon their heavy programme of capital expenditure in modernizing their factories and methods of production. The large increase in output from all their factories in the year under review was not a little due to this heavy capital expenditure. As yet there was little apparent reduction in the demand for their products and the unexecuted order book stood at an all-time record. No less than 90 per cent of their output of oil engines and their parts were destined for the export market.

Davey Paxman & Co., Ltd., report a trading profit for the year ended 31st March last of £773,874, as compared with £253,471 for the previous year, and a net profit of £305,780 (against £75,413). After allocating £70,000 to plant replacement, £120,000 to stock and general contingencies, £40,000 to general reserve and £50,000 to pension reserve, it is again proposed to pay an ordinary dividend for the year of 10 per cent. The balance carried forward is £24,186 (against £21,986 brought in).

In the course of his speech at the annual meeting held on 28th July, Mr. H. Riggall (chairman) said that on the diesel side they achieved their highest output yet. The programme of supplying diesel generating sets to meet the fuel and electricity cuts was now reaching conclusion and their Britannia Works were in process of reorganization as a self-contained unit for the manufacture of smaller oil engines. Their order book was well filled and was thought to consist of genuine orders.

Cable & Wireless, Ltd.—The report and accounts for 1948 were published last week as a White Paper. These show a profit, before U.K. taxation, of £1,711,840, as compared with £1,722,592 for the previous year. U.K. profits tax requires £191,766, income tax £749,591, and provisional appropriation on profits to special account under Treasury agreement £74,774. Cable & Wireless dividend requires £660,000 (same), and £769,572 is carried forward (against £753,261 brought in).

In a review of the company's operations it is stated that 3,000 nautical mies of submarine cable was used during the sixteen months ended 30th April last for repairs and renewals, and 2,800 nautical miles of cable interrupted during the war was restored to service. Among the cables restored were the former Hong Kong-Labuan cable, while substantial progress has been made with the renewal of the former Singapore-Labuan cable.

The Dubilier Condenser Co. (1925), Ltd., reports a trading profit for the year to 31st March last of £130,466, as compared with £213,964 for 1947-48, and after providing for depreciation, taxation, etc., a net balance of £43,586 (against £74,951). The ordinary dividend for the year is unchanged at 20 per cent, and £83,291 is carried forward (against £53,672 brought in).

Parmiter, Hope & Sugden, Ltd., report a trading profit of £136,575 for the year ended 31st March last, as compared with £83,180 for the previous year, and a net balance of £53,175 (against £34,809). General reserve receives £35,000, and the ordinary dividend for the year is maintained at 30 per cent. In addition this year a jubilee bonus of 20 per cent is paid. The balance carried forward is £62,412 (against £59,847 brought in).

The Pirelli-General Cable Works, Ltd., announces a net profit of £1,031,469 (against £1,236,559 for 1947-48). The dividend is maintained at 8 per cent and the bonus at 12 per cent.

New Companies

Fridgservice (Southern Counties), Ltd.—Registered 25th June. Capital £15,000. Manufacturers or dealers in refrigerators, refrigeration plant and equipment, etc. Directors: A. R. Warner (permanent) and Mrs. B. L. Durrell. Secretary: Rhoda M. Duplock. Regd. office: Regency Court, Church Street, Uckfield.

J. Rivlin, Ltd.—Registered 28th June. Capital £5,000. Manufacturers of and dealers in electrical apparatus, machines, accessories and equipment, wireless and television apparatus, etc. Directors: J. Rivlin and Mrs. S. Rivlin. Regd. office: 17, Brunswick Street, Leeds, 2.

Richard Daleman, Ltd.—Registered 4th July. Capital £10,000. Designers and manufacturers of and dealers in electric fluorescent, magnetic, animated and other signs, signals and devices, etc. Directors: R. C. Seed and J. M. H. Mange. Regd. office: Imperial House, Kingsway, W.C.2.

Bankruptcy

T. Sharpe, electrical contractor, lately carrying on business at 62, Oldham Road, Springhead, Yorks.—Last day for receiving proofs for dividend 9th August. Trustee, Mr. F. C. Ormrod, 20, Byrom Street, Manchester, 3, Official Receiver.

STOCKS and SHARES

THE present week has witnessed, fortunately enough, none of the dramatic fluctuations which characterized the markets during the last week of July. The previous decline in the prices of British Government securities developed into a real slump. For a time, the gilt-edged list seemed to be wellnigh friendless. Anticipated support from the Government did not materialize, and the selling went on with accumulating persistence until just before the holiday, when buyers came into the ascendant and prices hardened. The recovery seemed to have the effect of bringing in sellers who were not sorry to have an opportunity for getting out at prices above the lowest. A little Government support appeared and helped to fortify prices to some extent.

The Gilt-Edged Slump

From the beginning to the end of July, prices of gilt-edged stocks were generally weak, with a few spasmodic rallies. On balance, British Transport 3 per cents at 92 were down no less than 4⅜ on the month, and British Electricity "Threes" at 99⅜ showed a drop of 3⅛. There was, as already mentioned a mild rally which lifted prices from the lowest that they reached last week. How much of the recovery was due to bear purchasing, and how much to genuine investment, it is, of course, impossible to say.

Of other high-priced stocks, British Electric Traction deferred at 1575 is up 100 points since a month ago, the improvement being stimulated by the decision to keep the company in being and not to attempt a sale of its assets to the Government. Cable & Wireless ordinary, after touching 238, came back to 230, a rise on the month of 3½ points, the preference at 110 being 1½ down.

Electrical Equipment Shares

Until right at the end of July, many electrical engineering and other important industrials showed a fine disregard for the defections of the gilt-edged market, and confounded most of the prophets by making a little ground in places. Credit seems due to the faithful adherence of investors, whenever the value of money comes under suspicion, to equities which back the holder's money with the tangible assets of established enterprises, especially when there is every indication of active business for years to come, as in most branches of the electrical trade. However, with the collapse of gilt-edged at the centre of the line, a general withdrawal became inevitable and the month finished with a widespread adjustment of prices to the higher yield standard.

The month's price fluctuations, nevertheless, are somewhat mixed. As compared with a month ago, there are a fair number of improvements, while losses on the whole are of no great account. Vactrics have gone back 5s, Ward & Goldstone a similar sum. East African Power, Metal Industries "B," and J. Lucas, are 5s to the good; Pye deferred at 26s 3d and Telegraph Constructions at 50s are both 3s 9d better. Falk Stadelmann lost the same amount at 41s 3d. Most of the other movements in prices range from 6d to 2s.

G.E.C. Results

A decline of the order of £700,000 in General Electric's group trading profit, totalling £3,776,500 for the year ended last March, caused no particular concern in the electrical equipment market. Consolidated profit, after tax, comes out at just under £1¼ millions, so that after payment of the preference dividends, the 17½ per cent distribution on the ordinary still appears to be covered fully three times by earnings. The yield on the shares is £4 5s 9d per cent at 81s 6d, the price showing no net change since a month ago.

Globe Telegraph's Assets

Globe Telegraph & Trust's future is bound up with that of Cable & Wireless (Holding), for the latter accounted for £218,000 out of the Trust's total investment income of £358,000 during the year ended last June. The company holds over £4¼ million nominal preference and ordinary stock in Cable & Wireless, and a further million in Cables Investment Trust. At cost figures, the Cable & Wireless stocks represent over £2 millions of the £3¾ millions in quoted securities; these had a month ago a market value of more than £7½ millions. At just under 40s the shares pay about 2½ per cent net on the 5 per cent tax free dividend.

Enfield Cables New Shares

Enfield Cables new 4½ per cent second preference shares made their debut last week against a background of rapidly falling gilt-edged prices. In the circumstances the issue—which was over-subscribed—did well to maintain a small premium on the offered price of 20s. Preference shares as a group have naturally followed to some extent in the train of Government securities: nevertheless the yield of practically 4½ per cent on the Enfield shares still looks comparatively generous, particularly if the price is credited with about 4½d per share as the amount currently saved in stamp duty by the purchaser of renounced allotment letters. The company's new ordinary shares, offered at 27s 6d are quoted 6d higher.

Electrical Investments

Past Month's Price Changes

Company	Dividend Previous	Dividend Last	Middle Price 29th July 1949	Month's Rise or Fall	Yield p.c.
Overseas Electricity Companies					£ s. d.
Atlas Elec. ...	2	2½	12/-	+6d.	4 3 4
Calcutta Elec. ...	6†	6†	24/-	+2/-	5 0 0
Cawnpore Elec. ...	13	10	35/-	−½	5 14 3
East African Power	7	7	40/9	+5/-	3 8 8
Jerusalem Elec. ...	5	6	17/6	−6d.	—
Madras Elec. ...	8	5	25/-	−½	4 0 0
Nigerian Elec. ...	12½	10	31/9	+6d.	—
Palestine Elec. "A"	7†	Nil	30/6	+6d.	—
Perak Hydro-elec.	Nil	Nil	10/6	+1/-	—
Whitehall Inv. Pref.	—	6	23/-	−2/-	5 4 4
Equipment and Manufacturing					
Aberdare Cables ...	10	15	51/3	−⅛	5 17 0
Aron Elec. Ord. ...	15	15	42/6	−¼	7 1 2
Assoc. Elec. Ord. ...	15	15	71/6	−4/9	4 4 3
Automatic Tel. & El.	12½	12½	59/6	−½	4 4 6
Babcock & Wilcox	15	15	55/6	−2/-	5 8 0
Baldwin, H. J. (2/-)	25	25	6/9	−6d.	7 8 2
British Aluminium	10	10	43/-	−9d.	4 13 0
B.I. Callender's ...	6¾	6¾	32/-	+2/-	4 7 0
British Thermostat (5/-)	23½	25	25/-	−⅛	5 0 0
British Vac. Cleaner (5/-)	20	20	8/-	−¼	12 10 0
Brush Ord. (5/-) ...	—	10	5/3	−9d.	9 1 10
Burco (5/-) ...	35	35	18/9	+⅛	9 6 8
Chloride El. Storage	20	20	92/6	−¼	4 6 7
Cole, E. K. (5/-) ...	22½	20	11/6	+6d.	—
Cossor, A. C. (5/-)...	Nil	Nil	5/6	−1/-	—
Crabtree (10/-) ...	17½	17½	33/-	+6d.	5 6 1
Crompton Parkinson Ord. (5/-) ...	22½	22½	24/-	+1/-	4 13 9
De La Rue (5/-) ...	50	50	27/-	−3/-	9 5 2
Decca (1/-) ...	112½	112½	13/9	+9d.	8 3 9
E.M.I. (10/-) ...	6	8	14/6	−9d.	5 10 4
Electrical Components (5/-) ...	20	20	10/9	−1/9	9 6 0
Elec. Construction	12½	12½	50/-	−5/-	5 0 0
Enfield Cable Ord.	7½	7½	26/3	...	5 14 4
English Electric ...	10	10	45/-	+6d.	4 9 0
Ericsson Tel. (5/-)	20†	20†	42/-	st.	2 7 9
Ever Ready (5/-)	40	40	28/-	−3d.	7 2 10
Falk Stadelmann ...	15	15	41/3	−⅛	7 5 8
G.E.C. Ord. ...	17½	17½	81/6	st.	4 5 9
General Cables (5/-)	50	50	20/-	...	—
Greenwood & Batley	15	15	47/6	−⅛	6 6 1
Hackbridge Cable (5/-)	—	20(est.)	14/6	+6d.	—
Hackbridge Hewittic (5/-)	12	12½	11/-	+3d.	5 13 8
Hall Tel. Acc. (10/-)	10	10	13/-	−6d.	7 13 10
Heatrae (2/-) ...	12½	12½	4/-	−1/-	6 5 0
Henleys (5/-) ...	20	20	23/6	+1/-	4 5 1
Hoover (5/-) ...	40	40	28/3	st.	7 1 7
Intl. Combustion (5/-)	37½	37½	43/9	+⅛	4 5 7
Johnson & Phillips	15	15	63/-	+6d	4 15 3
Equipment and Manufacturing (continued)					£ s. d.
Lancashire Dynamo	22½	22½	95/-	+⅛	4 14 3
Laurence, Scott (5/-)	12½	12½	12/3	−1/-	5 2 1
London Elec. Wire	10	10	44/6	+1/-	4 10 0
J. Lucas	17½	17½	72/6	+½	4 16 8
Mather & Platt ...	11	11	48/9	−2/-	4 10 2
Metal Industries (B)	10	10	41/3	+5/-	4 17 0
Mid. Elec. Mfg. ...	35	35	8½	+⅛	4 5 0
Murex	20	20	93/9	+⅛	4 5 6
Newman Ind. (2/-)	22½	17½	4/3	−3d.	8 4 8
Oldham & Son (1/-)	60	60	8/9	+3d.	6 17 0
Plessey (5/-) ...	30	20	13/9	−9d.	7 5 5
Parsons C. A. ...	12½	12½	58/9	−⅛	4 5 0
Pye Deferred (5/-)	25	25	26/3	+⅛	4 15 3
Radio & Tel. (2/-)	Nil	25	2/6	−1/-	—
Revo (10/-) ...	27½	27½	50/-	+½	5 10 0
Reyrolle	12½	12½	57/6	−½	4 6 10
Scophony (5/-) ...	—	—	2/6	−6d.	—
Scot. Cable (4/-) ...	30	30	22/6	−6d.	5 5 6
Siemens Ord. ...	7½	7½	31/3	−⅛	4 16 0
Switchgear & Cowans (5/-)	20	20	12/6	−⅛	8 0 0
T.C.C. (10/-) ...	15	15	33/9	−⅛	4 8 9
T.C. & M.	10	10	50/-	+⅛	4 0 0
Telephone Mfg. (5/-)	9	9	8/9	−3d.	5 14 3
Thorn Elec. (5/-) ...	25	25	15/-	−⅛	—
Tube Investments	25	25	5½	−⅛	4 8 0
Vactric (5/-) ...	Nil	Nil	13/9	−5/-	—
Veritys (5/-) ...	5	5	2/6	−6d.	10 0 0
Walsall Conduits (4/-)	70	70	57/6	−1/8	4 17 2
Ward & Goldstone (5/-)	50	50	50/-	−5/-	5 0 0
Watford (2/-) ...	15	20	6/-	−3d.	6 13 4
Westinghouse Brake	14	14	64/6	−6d.	4 6 10
West, Allen (5/-) ...	10	10	10/3	−3d.	4 17 7
Transport and Communications					
Anglo-Am. Tel.: Pref.	6	5⅝	106	−3	—
Def.	1½	1½*	17½	+3	—
Anglo-Portuguese	8	8	24/3	−2/-	6 12 0
Brit. Elec. Traction: Def. Ord. ...	50	50	157/6	+100	3 3 6
Calcutta Trams ...	10	Nil	20/-	+⅛	—
Cape Elec. Trams	6	6	22/6	+1/9	5 6 8
Cable & Wireless: 5½ Pref. ...	5½	5½	110	−1½	5 0 0
Ord.	4	4	230½	+4	—
Globe Tel. & Tel. Ord.	5†	5†	40/-	−4/-	2 10 0
Great Northern Tel. (£10)	12	7	12	−½	5 16 8
Inter. Tel. & Tel....	Nil	Nil	15	+2	—
Marconi Marine ...	7½	7½	25/-	−½	6 0 0
Oriental Tel. Ord....	10	16	45/9	+⅛	7 0 4
Telephone Props ...	6	6	9/6	−1/9	12 12 8
Tele. Rentals (5/-)	10	10	9/9	−9d.	5 2 7

*Dividend postponed.

†Dividends are paid free of Income Tax.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1943

17739. General Electric Co., Ltd., and Espley, D. C.—Film-transmitting television apparatus. 27th October, 1943. (626205.)

1944

1945. British Thomson-Houston Co., Ltd., and Scott, W. J.—Electron-discharge devices of the velocity modulation type having a resonant cavity. 2nd February, 1944. (626289.)

14539. Sperry Gyroscope Co., Inc.—Remote control systems. 30th July, 1943. (626291.)

1945

6322. British Thomson-Houston Co., Ltd.—Magnetrons. 14th March, 1944. (626293.)

22080. Hurley, jun., S. C.—Apparatus for controlling the flow of current through an electronic circuit. 23rd September, 1944 (626295.)

22376. Yadoff, O.—Apparatus for spraying electrostatically charged powders. 30th August, 1945. (Convention date not granted.) (626296.)

33459. Standard Telephones & Cables, Ltd., and Cragg, W. D.—Acoustic instruments. 11th December, 1945. (626453.)

1946

10999. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Process of manufacturing an optical element. 19th July, 1941. (626528.)

11870. General Electric Co., Ltd., and Francis, V. J.—High-pressure gas or vapour electric-discharge lamps. 17th April, 1946. (Cognate application 17975/46.) (626303.)

11872. British Thomson-Houston Co., Ltd.—Directional antenna systems. 30th July, 1943.) (626304.)

13016. West & Co., Ltd., A., and Niblett, F. T.—Spring means for biasing rotatable elements. 30th April, 1946. (626460.)

14419. Aladdin Industries, Ltd., and Hebard, H. C.—Electric-heating devices. 13th May, 1946. (626463.)

15696. Marconi's Wireless Telegraph Co., Ltd., Twatt, J., and Banks, G. B.—Subaqueous echo sounders. 23rd May, 1946. (626308.)

15697. Marconi's Wireless Telegraph Co., Ltd., and Twatt, J.—Echo sounders and like subaqueous pressure wave apparatus. 23rd May, 1946. (626309.)

16390. Marconi's Wireless Telegraph Co., Ltd., and Twatt, J.—Echo sounders and like subaqueous pressure wave apparatus for example to echo sounders. 23rd May, 1946. (626310.)

19065. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Optical systems comprising an element for correcting the spherical abberation of the system. 21st October, 1939. (626530.)

20079. Sadir-Carpentier.—Navigation aiding radio systems. 12th October, 1944. (626471.)

21013. Standard Telephones & Cables, Ltd.—Radio navigation system. 26th September, 1945. (626477.)

22834. Brush Development Co.—Electro-mechanical translating means. 27th August, 1945. (626215.)

22936. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. — Dry-shaving apparatus. 19th January, 1940. (626480.)

24458. Igranic Electric Co., Ltd.—Silver base non-welding electrical contacts and methods of making the same. 17th August, 1945. (626483.)

25065. Dulrae Patents, Ltd., Musgrave, J. L., and Lewis, D. G.—Electrical heating elements. 22nd August, 1946. (626484.)

25108. Tunnicliffe, E. A. J., and Wilkins, S. R.—Electrical capacitors. 22nd August, 1946. (626217.)

26829. General Electric Co., Ltd., and Friedlander, E. S.—Field excitation arrangements for electric alternators. 6th September, 1946. (Cognate application 37128/46.) (626219.)

27588. British Thomson-Houston Co., Ltd.—Control arrangements for discharge lamps. 17th September, 1945.) (626220.)

27720. Babcock & Wilcox, Ltd.—Closure means for openings in walls of chambers arranged to contain gas under pressure. 21st September, 1945. (626322.)

27824. Submarine Signal Co.—High-frequency spark transmitting systems. 5th October, 1945. (626323.)

28058. Sadir-Carpentier.—Navigation aiding radio systems. 30th December, 1943. (626324.)

28304. Standard Telephones & Cables, Ltd.—Receiving and indicating system for a variable-frequency rotary beacon. 11th June, 1945. (626325.)

28738. Speak, H. J. A., and Royle, D.—Electric table lighters. 26th September, 1946. (626494.)

28945. Hunt, Ltd., A. H., and Booth, F. O.—Trimmer capacitors. 27th September, 1946. (626495.)

29201. Triggs, W. W. (Crompton & Knowles Loom Works).—Electric warp stop-motions for looms. 1st October, 1946. (626496.)

30832. Philips Lamps, Ltd.—Apparatus comprising a current converting tube. 30th January, 1943. (626331.)

31104. Birlec, Ltd., and May, E.—Heating with high-frequency electric current. 18th October, 1946. (626332.)

31792. Sadir-Carpentier.—Navigation aiding radio systems. 28th July, 1942. (626333.)

32281. Rotax, Ltd., and Bourne, W. G.—Thermally-responsive electric circuit-breakers. 30th October, 1946. (626335.)

32367. Caplin, F., and Bagley, J. H.—Radio direction finding installations. 31st October, 1946. (626224.)

32601. Electro Methods, Ltd., and Tweedy, S. E.—Magnetic amplifying circuits. 15th October, 1947. (626338.)

33603. Cherry-Burrell Corporation.—Electric switches housed in sealed casings. 4th May, 1946. (626339.)

34924. Philips Lamps, Ltd.—Circuits for amplifying ultra-high-frequency electrical oscillations. 21st April, 1943. (626349.)

35817. Marconi's Wireless Telegraph Co., Ltd.—Radar systems. 30th April, 1941. (626351.)

36337. British Thomson-Houston Co., Ltd.—Methods for preparing organo-silicon halides. 8th December, 1945. (626353.)

37276. General Electric Co., Ltd., and Farnsworth, J.—Methods of forming metal coatings on bases of ceramic, refractory or high melting point vitreous material. 18th December, 1946. (626357.)

37674. Babcock & Wilcox, Ltd.—Boilers. 22nd December, 1945. (626231.)

37771. Western Electric Co., Inc.—Piezo-electric crystal apparatus. 28th December, 1945. (626365.)

37815. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Cutting plates of dry-shaving apparatus. 23rd July, 1943. (626367.)

2337. Marconi's Wireless Telegraph Co., Ltd.—Radar systems. 13th September, 1941. (626236.)

2787. Glaser, H.—Means for supporting electric lamps for illuminating Christmas trees. 29th January, 1947. (626532.)

3042. General Electric Co., Ltd., Francis V. J., and Willoughby, A. H.—Earthing arrangements for fittings housing electric-discharge devices. 31st January, 1947. (626375.)

3735. Imovilli, S.—Electric motor. 7th February, 1947. (626379.)

5996. Tilling-Stevens, Ltd., Norburn, W. H. J., and Freeman, F.—Electrical apparatus or machines. 3rd March, 1947. (Addition to 621568.) (626383.)

8444. Philips Lamps, Ltd.—Low-frequency transformers. 30th June, 1944. (626241.)

9325. Standard Telephones & Cables, Ltd., Ellison, L. J., and Marrow, S. H.—Dry contact rectifiers. 8th April, 1947. (626384.)

9933. British Mechanical Productions, Ltd., and Deakin, S. T.—Screw-type electrical socket-holder for lamps, fuses, and like devices. 14th April, 1947. (626243.)

10021. British Thomson-Houston Co., Ltd.—Methods of preparing organogermanium halides. 16th April, 1946. (626398.)

10247. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Apparatus for synchronously controlling the movement of motors. 17th April, 1947. (626399).

10409. Telefonaktiebolaget L. M. Ericsson.—Electric condensers. 18th April, 1946. (626544.)

10661. Liebmann, G.—Methods of producing carbon resistors. 22nd April, 1947. (626246.)

11692. British Thomson-Houston Co. Ltd.—Systems for controlling the connection of a load across a direct-current motor supplied through a rectifier. 1st May, 1946. (626247.)

12578. Ajax Electric Co., Inc.—Apparatus for charging and discharging a furnace. 26th July, 1946. (626403.)

13887. Babcock & Wilcox, Ltd.—Closure means for openings in walls of chambers arranged to contain gas under pressure. 23rd May, 1946. (626249.)

15015. General Electric Co., Ltd., Furneaux, W. D. C., and Gossling, B. S.—Electrodes for use in diathermic of like apparatus. 6th June, 1947. (626407.)

15534. British Thomson-Houston Co. Ltd.—Trimethyl halogenophenylsilanes. 14th June, 1946. (626515.)

15655. General Electric Co., Ltd., and Morris, K. S.—Electric lighting fittings. 13th June, 1947. (626569.)

16049. Westinghouse Electric International Co.—Gas turbine power plants. 17th August, 1945. (626571.)

16188. Measurement, Ltd., and Howard, E.—Electricity meters. 19th June, 1947. (626572.)

16290. Radio Relay Industries, Ltd., and Moss, L. R.—Electric Switch. 20th June, 1947. (626573.)

16623 Philips Lamps, Ltd.—Electromagnetic ignition device intended for use with electric-discharge tubes filled with gas and/or vapour. 27th June, 1946. (626412.)

17066. British Thomson-Houston Co., Ltd.—Preparation of organohalogenosilanes. 28th June, 1946. (626519.)

17105. General Electric Co., Ltd., and Robson, R.—Conveyor drives. 28th June, 1947. (626520.)

17116. Ginn, S. R.—Magnetically-operated mercury electric switches. 28th June, 1947. (626418.)

19356. American Bosch Corporation.—Variable capacity fluid rotary pumps and motors. 14th May, 1946. (626253.)

21086. Sylvania Electric Products, Inc.—Ultra-high-frequency generator of the magnetron-type. 12th June, 1943. (626255.)

21429. Compagnie Générale de Télégraphie sans Fil.—Transmission of television signals on ultra-short waves. 9th August, 1946. (626592.)

22377. Tilling-Stevens, Ltd., and Crampton, C. G.—Multi-contact controllers or switches. 12th August, 1947. (626593.)

22688. Standard Telephones & Cables, Ltd., and Garfield, W. L.—Frequency modulation systems. 15th August, 1947. (626595.)

22760. British Thomson-Houston Co., Ltd., Lowson, J. C., and Bellchambers, H. E.—Interior electric lighting fittings. 15th August, 1947. (626596.)

22909. Gilbert Gilkes & Gordon, Ltd., and Wilson, P. N.—Speed regulation of water turbines. 18th August, 1947. (626256.)

22952. English Electric Co., Ltd., and Ball, R. D.—Dynamo-Electric machines. 19th August, 1947. (626258.)

23056. Westinghouse Brake & Signal Co., Ltd.—Asymmetric conductors. 21st August, 1946. (626262.)

23081. Westinghouse Electric International Co.—Housings for electrical apparatus. 22nd August, 1946. (626263.)

23165. Plessey Co., Ltd.—Transformers. 28th August, 1946. (626266.)

23182. Gutkin, L. A.—Air circulating fans. 21st August, 1947. (626267.)

23273. Westinghouse Brake & Signal Co., Ltd.—Electrical relays. 19th March, 1943. (626271.)

23344. C. A. Parsons & Co., Ltd., Voysey, R. G., and Hughes, D. F.—Flame tubes for gas turbine combustion chambers. 22nd August, 1947. (626275.)

23387. Caudrelier, R. E.—Electrical switch devices. 23rd August, 1947. (626277.)

23518. British Thomson-Houston Co., Ltd.—Insulated electrical conductors. 27th August, 1946. (626599.)

23693. Igranic Electric Co., Ltd.—Electrical relay control systems. 29th August, 1946. (626434.)

23713. Western Electric Co., Inc.—Relays. 28th August, 1946. (626435.)

23723. British Thomson-Houston Co., Ltd.—Methods of and apparatus for making sectional wires. 27th August, 1946. (626436.)

23759. Akt.-Ges. Brown, Boveri & Cie.—Multi-row impulse wheel for steam or gas turbines. 27th August, 1946. (626437.)

23795.—Frost & Co., Ltd., H., and Perrigo, A. E. B.—Dynamo-Electric machines. 28th August, 1947. (626439.)

Trade Marks

THE following applications have been made for trade marks. Objections may be entered within a month from 27th July:—

EGA (design).—No. 675,620, Class 6. Electric conduit tubing and junction fittings therefor, all of metal. Ega Electric, Ltd., Holyhead Road, Wednesbury.

STREBOR.—No. 674,798, Class 7. Electric current generators for vehicles and parts of such generators included in Class 7, vulcanizing apparatus, etc. No. 674,799, Class 8. All goods included in Class 8. No. 674,800, Class 9. Electric accumulators, ammeters, batteries, cigar and cigarette lighters, induction coils, connections, contacts, fuses, push-buttons for vehicle horns, speed indicators, distance indicators, junction boxes for vehicle lighting, fuel meters, switches, etc. Roberts Export & Trading Co., Ltd., 47-59, Hopton Street, Southwark Street, London, S.E.1.

VICTOR.—No. 671,172, Class 9. Gate-end boxes, being electric controlling apparatus for use in connection with mining drilling machines, and parts thereof included in Class 9. No. 671,173, Class 11. Flameproof lighting fittings and parts thereof included in Class 11. Victor Products (Wallsend), Ltd., Church Bank Offices, North Terrace, Wallsend-on-Tyne.

MAGNAVISTA (design).—No. 673,458, Class 9. Television lenses. Metro Pex, Ltd., 71, Queen's Road, Peckham, London, S.E.15.

FLEXATONE.—No. 673,677, Class 9. Sound wave producing and transmitting apparatus and parts thereof included in Class 9, but not including cells for electric batteries. Central Rediffusion Services, Ltd., Carlton House, Lower Regent Street, London, S.W.1.

WALTRIC.—No. 674,059, Class 9. Electric switchgear, combined electric switches and plug sockets, and electric measuring instruments. Walsall Electrical Co., Ltd., 61, Bridge Street, Walsall.

AEROLOID.—No. 671,910, Class 11. Ventilating fans and blades. Hordern-Richmond, Ltd., Hydulignum, Haddenham, Bucks.

DARLITE (design).—No. 671,595, Class 11. Electric standard lamps, wall brackets and electroliers. Darlingtons, Ltd., St. Mary's Works, Everton Valley, Liverpool, 4.

TOWNSMAN.—No. 675,970, Class 12. Electrically propelled road vehicles, and parts thereof not included in other classes. Hindle, Smart & Co., Ltd., Merefield Works, Ardwick, Manchester, 12.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Ashton-under-Lyne.—12th August. Housing Committee. Electric wiring of 106 houses. (29th July.)

Australia.—BRISBANE.—23rd September. Supply of 200 kVA and 300 kVA transformers. (C.R.E. (I.B.) 19513/49. Ten/538.)*

Eastbourne.—29th August. Town Council. Electrical installations in 98 houses on the Chatfield-Davies estate. Borough engineer, 2-4, Saffrons Road.

India.—MADRAS.—14th September. Department of Electricity. One 10,000 kW turbo-alternator, boilers, transformer and switchgear for Madura Thermal Scheme. (C.R.E. (I.B.) 18760/40. Ten/491.)*

Leigh (Lancs).—20th August. Lancashire County Council. Electrical installation at Technical School extensions. (See this issue.)

Manchester.—22nd August. Highways Committee. Supply of 4,750 globes for street lighting. (29th July.)

Merton and Morden.—17th August. U.D.C. Street lighting installations. (29th July.)

New Zealand.—WELLINGTON.—1st November. State Hydro-Electric Department. 66 kV outdoor switchgear. (C.R.E. (I.B.) 19335/49. Ten/504.)*

AUCKLAND.—29th August. Electric Power Board. Braided aerial cable. (C.R.E. (I.B.) 20243/49. Ten/531.)*

Queensbury and Shelf.—20th August. Urban District Council. Sodium street lighting equipment. (29th July.)

Reading.—3rd September. Borough Council. Electrically driven automatically controlled pumping plant. Howard Humphreys & Son, 34, King's Road.

South Africa.—CAPE TOWN.—26th September. Electricity Department. Metal-clad service cutouts. (C.R.E. (I.B.) 19729/49. Ten/530.)*

***Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.**

Orders Placed

Bradford.—Corporation. Electrostatic dust precipitators at the sulphuric acid plant of the Sewage Committee (£12,785).—W. C. Holmes.

Hastings.—Corporation. Electrical installations at seven houses at Rock Lane estate (£189).—S. F. Chapman & Son.

Middlesex.—County Council. Improvements to electric lighting system at the Ealing, Drayton Manor, County School (£1,131).—T. Clarke & Co.

Northumberland.—Education Committee. Installation of electric lighting at the Newbiggin East County Primary School (£982).—J. & A. Oliver.

St. Pancras.—Borough Council. Electrical installations in dwellings on Goldington Street site (£8,050).—E. Wright & Co. (Muswell Hill).

South Shields.—Education Committee. Electrical installation at Redwell Lane County Secondary School (£6,847).—Law & Burns.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ashford (Kent).—Flats (68), Stones estate, Beaver Road; J. Sudlow, clerk to U.D.C., Church Road.

Bedford.—Houses (52), Harrowden Road site; borough surveyor.

Birmingham.—Training college for teachers, Knowle; H. J. Manzoni, city engineer.

Brighton.—Factory, Hollingbury light industrial area; Lawes Rabjohns, Ltd., Abbey House, Victoria Street, S.W.1.

Extensions and adaptations at "Tivoli," London Road (£36,000); D. J. Howe, borough surveyor, King's Road.

New housing offices, Edward Street; borough surveyor.

Bury St. Edmunds.—Technical institute near Silver Jubilee School (£20,662) for West Suffolk C.C.; H. C. Greengrass & Sons, builders, Norwich.

Canterbury.—Assembly hall (£100,000); city surveyor, Municipal Buildings.

Cardiff.—Large service depot, Western Avenue and North Road; Leyland Motors, Ltd., Leyland, Lancs.

Corbridge.—Additional nurses' accommodation at the Charlotte Hospital; R. C. Williamson, Ltd., builders, West Auckland, Co. Durham.

Coventry.—Central bus garage, Pool Meadow; city architect.

Darlington.—Works additions, West Auckland Road, for the Chemical and Insulating Co., Ltd.; S. W. Milburn & Partners, architects, 9, The Esplanade, Sunderland.

Primary school, Firth Moor estate; borough architect.

Daventry.—Electrification of water works; A. J. Paxman, borough surveyor.

Droitwich.—Houses (20), Stalls Farm estate; B. Whitehouse & Sons, Ltd., 247, Monument Road, Birmingham, 1.

Dukinfield.—Houses (20), Dukinfield Lodge site; Cruikshank & Seward, 16, Princess Street, Manchester, 1.

Durham.—Provision of school meals facilities at 46 schools; county architect, Court Lane, Durham.

Eastbourne.—Houses (20), Chatfield-Davis estate; Usher & Martin, Ltd., builders, 375, Lewisham High Street, S.E.13.

Flintshire.—Horticultural training centre, Celyn Farm, Northop; W. Griffiths, deputy county architect.

Gateshead.—Houses (18), Saltwell Road; borough engineer.

Glasgow.—Research laboratory (£60,000); Jas. Howden & Co., engineers, Scotland Street, C.5.

Glendale.—Houses (68) for R.D.C.; surveyor, Council Offices, Wooler, Northumberland.

Gloucester.—Houses (84), Eastern Avenue site; city architect.

Gosforth (Northumberland).—Cinema, Haddricksmill Road; C. Solomon, architect, 3, St. Mary's Place, Newcastle.

Guildford.—New buildings at Royal Surrey County Hospital; South-West Metropolitan Regional Hospital Board, 11a, Portland Place, W.1.

Hainault.—Fire station, New Road, for Essex C.C.; H. Conolly, county architect, County Hall, Chelmsford.

Halifax.—Houses (150), Illingworth, and old people's bungalows (84), Willowfield; G. Holden, borough surveyor, Crossley Street.

Harrow.—Dwellings (140), Edgware Golf Course estate; U.D.C. surveyor, Council Offices, Uxbridge Road, Stanmore.

Hastings.—New schools, Parker Road; borough surveyor, Wellington Square.

Hebburn-on-Tyne.—Houses (38), Campbell Park housing site, for the U.D.C.; direct labour.

Hemel Hempstead.—Houses (78), Beechfield estate, in three schemes; C. W. G. Kirk, town clerk, Town Hall.

Inverness.—Houses (70); Alex Cullen, county architect, The Castle, Inverness.

Keighley.—School, Guard House; E. G. Felgate, borough architect.

Liverpool.—Police houses (10), Pemberton Road; Capstick & Owen, Ltd., 331, East Prescot Road, Liverpool, builders.

London.—New wing at Royal College of surgeons, Lincoln's Inn Fields; Young & Hall, architects, 9, Southampton Row, W.C.1.

MILL HILL.—Houses (120), Moat Mount estate; George Wimpey & Co., Ltd., builders, 27, Hammersmith Grove, W.6.

HOLBORN.—Rebuilding Hall of Staple Inn; Prudential Assurance Co., Ltd., Holborn Bars, E.C.1.

SOUTHWARK.—Flats (49), in two blocks, Morley Street; Sydney Clough, Son & Partners, architects, 115, Park Street, W.1.

Lowestoft.—Houses (394), No. 2 housing site; borough surveyor.

Luton.—Primary school, Farley; borough engineer.

Houses (25), Eaton Valley Road; Weedon, Ltd., builders, 49, Park Street.

Malvern.—Secondary modern school, Poolbrook; county architect, 60, The Tything, Worcester.

Newcastle-on-Tyne.—Physiotherapy department, New Bridge Street, for the Committee of Newcastle Dispensary; Newcombe & Newcombe, architects, 23, Eldon Square.

Houses (267), Benton, for the City Council; Cussins, Ltd., Moor Court, Gosforth.

Newcastle-under-Lyme.—Methodist church at Bradwell estate; architects, Wood, Goldstraw & Yorath, Gordon Chambers, Cheapside, Hanley, Stoke-on-Trent.

Northumberland.—Conversion of Brunton Camp into rural modern school (£20,000); county architect, County Hall, Newcastle-on-Tyne.

Norwich.—New college wing, Keswick Hall (£100,000), for board of governors; R. G. Carter, Ltd., builders, Drayton, Middlesex.

Nottingham.—Fire station, Old Lenton (£27,000); R. M. Finch, city engineer, Guildhall.

Nuneaton.—Houses (79); borough surveyor, Town Hall.

Oldbury.—Houses (32), Titford estate; Smith Bros., 570, Hagley Road, West Quinton.

Pewsey.—New block for 1,500 beds at Pewsey Colony; Oxford Regional Hospital Board, 16, King Edward Street, Oxford.

Reading.—Primary school, Geoffrey Field, second portion (£73,924), for E.C.; Crosby & Co., builders, Whitley Street.

Saltburn-by-the-Sea.—County primary school; F. Barraclough, secretary, Education Offices, County Hall, Northallerton.

Scarborough.—Houses (66), Eastfield, Seamer; borough engineer.

Sheffield.—Fire station, Darnall Road; W. G. Davies, city architect.

Shipley.—Dwellings (74), Leeds Road; U.D.C. surveyor.

Spennymoor.—Houses (120), Tudhoe Moor; U.D.C. surveyor.

Stockport.—Houses (56), Broomfield Drive site; Hugh Owen & Son, Ltd., Poyton Park, Poyton, Ches.

Stockton-on-Tees.—Additions to Stockton Isolation Hospital (£11,000); G. P. Stainsby, architect, 57, High Street.

Sunderland.—Extensions to the Atlas Works, Bonnersfield; Stephenson & Gillis, architects, Saville Chambers, North Street, Newcastle-on-Tyne.

Rebuilding motor works, Paley Street; W. Riddle, architect, 33, Jesmond Park West, Newcastle-on-Tyne.

Sutton-in-Ashfield.—Houses (200), Carsic Lane site; U.D.C. surveyor.

Swindon.—Modernization of swimming baths (£23,500); borough surveyor.

Walsall.—Factory and offices for H. J. Roberts (Confectionery), Ltd., Walsall Road, West Bromwich; C. E. M. Fillmore, architect, 8, Newhall Street, Birmingham.

Weardale.—Houses (40), Stanhope, for the R.D.C.; J. J. Eltringham, architect, Derwent Street, Blackhill.

Information Department

THE extensive records of our Information Department enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

"Tilley" leak detectors.

"Equator" water heaters.

"Grove" electric fans.

"Ace" water-heater thermostats.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.